Ambidexterity and Leadership

A Multilevel Analysis of the Aerospace and Defense Organizations

A thesis submitted as a partial fulfillment of the requirements for the degree of the Doctor of Philosophy

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DECLARATION

This thesis is submitted to the University of Warwick in support of my application for the degree of Doctor of Philosophy. It has been composed by myself and has not been submitted in any previous application for any degree. Parts of this thesis have been accepted at the following conferences and journals:

CONFERENCES

1. Kassotaki, O. and Paroutis, S. 2015. Ambidextrous leadership: A multilevel approach to effective corporate management, ***Strategic Management Society Conference,*** St. Gallen: Switzerland, May 28–30.

2. Kassotaki, O. 2015. Ambidextrous leadership: A multilevel approach for a superior performance in organizations, ***Strategy Conference 2015,*** Edinburgh: UK, April 30–May 1.

3. Kassotaki, O. 2016. Explaining ambidextrous leadership in high technology organizations, ***Academy of Management Annual Meeting,*** Anaheim, California: USA, August 5–9.

4. Kassotaki, O. and Kassotakis, I. 2016. Explaining ambidextrous leadership in high technology organizations, ***European Academy of Management Conference,***

Paris: France, June 1–4.

5. Kassotaki, O. 2016. Penetration of organizational ambidexterity across multiple organizational levels in a high technology international organization, ***European Academy of Management Conference,*** Paris: France, June 1–4.

JOURNAL PAPERS

In addition, parts of this thesis are undergoing a revision and resubmission process, or are under preparation for submission in the following journals:

1. Kassotaki, O., Paroutis, S., and Morrell, K. n.d. Ambidexterity penetration across multiple organizational levels in an aerospace and defense organization. ***Long Range Planning*** (revision and resubmission).

2. Kassotaki, O., and Paroutis, S. n.d. Explaining ambidextrous leadership in the aerospace and defense organizations. Full manuscript in the final stages of preparation for submission to a journal.

ABSTRACT

The global security concerns combined with the emergence of firms operating at international level have intensified the competition among companies in the aerospace and defense sector. In this challenging business environment, the adoption of organizational ambidexterity could provide a company with the key advantage in dealing with the increasing competitive forces. Organizational ambidexterity, which denotes the simultaneous use of exploration and exploitation in organizations, ensures both short-term profitable operation through the exploitation of successful current products and long-term survival through the exploration of innovative solutions for future customer needs.

According to ambidexterity and leadership literatures, transformational and transactional leadership styles, which constitute ambidextrous leadership behaviors, promote ambidexterity across multiple levels of the organization's structure and become key elements for the successful implementation of organizational ambidexterity. This enactment of ambidexterity across levels constitutes ambidexterity penetration, a term first introduced in this study. In this context, this study attempts to address research gaps in the ambidextrous leadership research by linking the micro-level leadership styles with the macro-level corporate structure and environment by investigating: (a) how ambidexterity penetrates across multiple levels vertically and horizontally, (b) which tensions emerge from ambidexterity penetration and how they are managed, and finally (c) whether the type and size of the particular organizational setting is related to this ambidexterity penetration.

To address these research questions, a dual case study research framework was used by analyzing data collected from: (a) a governmental organization with multiple business units dispersed throughout Europe, and (b) three aerospace and defense companies of different sizes with multiple business units in Europe and the United States. Data from 44 confidential, face-to-face and e-mail interviews, along with published archival information, was collected, compiled, and analyzed in the course of two years. The diversity of the studied business units in terms of type and size, and the compilation of data across multiple corporate levels (CEO to employee) provided a unique setting to uncover key findings that highlight the challenges and accomplishments of ambidextrous leadership in corporate and governmental organizational structures.

The systematic, multi-level analysis of the collected data revealed variations in ambidexterity penetration across multiple levels of management in different types of organizations as a result of corporate culture and environmental constraints. However, in most cases, the analysis also uncovered: (a) similar characteristics of low horizontal, but high vertical penetration of ambidexterity, mainly due to their inflexible organizational structure, (b) prevailing transactional (exploitative) leadership style, as their leaders appear to act mostly as ambidextrous managers, (c) ambidexterity penetration across multiple levels via similar processes irrespective of type and size of each organization, and finally (d) the key role of middle management as a cohesive link within the firm's structure that enables the ambidexterity penetration across management levels. In conclusion, this study contributes at the intersections of ambidexterity and leadership research in the context of the aerospace and defense sector and offers a timely empirical investigation of the competing challenges that these firms are called upon to face in the light of the emerging global security challenges and the subsequent vast investment in resources and capital.

CHAPTER 1

INTRODUCTION

1.1 Introduction

As the world changes, so do companies. New solutions are required for the challenges of the future, among which the most prominent are the increasing internationalization and diversity, the greater competition and time pressure, and the need to constantly innovate. In this new world market, organizations have to deal with a number of complex and usually contradictory challenges, and the way their managers have been struggling to resolve them has become a field of research for many scholars (Smith, Erez, Jarvenpaa, Lewis, & Tracey, 2017). Therefore, scholars have introduced the term of organizational ambidexterity, which describes the merging of two seemingly opposing conceptions in management.

Duncan (1976) was the first to introduce the term organizational ambidexterity, which was later developed and analyzed more thoroughly by March (1991). Organizational ambidexterity refers to the ability of organizations to balance exploration and exploitation, to adapt to environmental changes while relying on existing methods of business. Exploration refers to search, risk taking, experimentation, and innovation, whereas exploitation has to do with refinement, efficiency, implementation, and execution (March, 1991).

At first glance, the above two processes may be perceived as incompatible, as they both compete for scarce resources and demand diverse capabilities within the same organizational setup. While exploration is time consuming and requires long-term devotion with uncertain results, exploitation on the other hand relies on current knowledge and competences. Still, their proper balance would guarantee superior organizational performance and long-term survival, as successful ambidextrous organizations can explore new opportunities by adopting innovative practices, and at the same time, exploit their resources efficiently in their current operations (March, 1991).

In line with March's work (1991), Tushman & O'Reilly (1996, 1997) developed the term organizational ambidexterity by introducing evolutionary and revolutionary change processes. They emphasized the structural separation between the two different types of activities. In the short run, managers must constantly increase the fitness of strategy, structure, and culture (evolutionary change), whereas in the long run, they may be required to destroy the alignment that made their companies successful (revolutionary change). This is the dilemma that they confront in their organization, where they must invest part of their time in operating in a world of relative stability and the other part of their time in bringing about revolutionary changes in the world.

Tushman & O'Reilly's (1996,1997) ideas were received positively in the business world, yet their contribution received little academic attention until Gibson & Birkinshaw's (2004) article *The Antecedents, Consequences and Mediating Role of Organizational Ambidexterity in the Academy of Management Journal* was

published. This article outlined the tensions between organizations' capacity for alignment and adaptability and the role of organizational context, where the organizational ambidexterity concept was utilized to achieve the balance between the above two opposites. Even though the authors did not intend to have the ambidexterity concept as a central notion *per se* (Birkinshaw & Gupta, 2013), the term obtained high recognition, and since then, there has been a proliferation of interest in and research on organizational ambidexterity.

In that respect, research output on organizational ambidexterity includes articles (e.g. Birkinshaw & Gupta, 2013; Boumgarden, Nickerson, & Zenger, 2012; Hill & Birkinshaw, 2014; Jansen, Simsek, & Cao, 2012; Junni, Sarala, Taras, & Tarba, 2013; Junni, Sarala, Tarba, Liu, & Cooper, 2015; Papachroni, Heracleous, & Paroutis, 2016; Tushman & O'Reilly, 2013), special issues of the topic in top journals (*Academy of Management Journal,* August 2006; *Organization Science,* August 2009; *Human Resource Management*, December 2015; *Organization Studies*, forthcoming), symposia (*Academy of Management Perspectives,* November 2013), conferences (4th European Conference on Entrepreneurship and Innovation, September 2009), books (Reinmoeller, 2014), and doctoral research (Blarr, 2012; Chandrasekaran, 2009; Kortmann, 2011; Papachroni, 2013).

Even though this plethora of research output has provided the opportunity to broaden our understanding of the topic, it has also brought confusion to the scene and raised questions with respect to its proper implementation (Birkinshaw & Gupta, 2013). It must be taken into account that research on organizational ambidexterity is not only about how organizations could become efficient and innovative, but also about how

they can develop the capabilities necessary to survive in the new and evolving market environment (Papachroni, Heracleous, & Paroutis, 2015). It is difficult, though, to keep focus on the main questions of organizational ambidexterity and not lose sight of its main concept. It is because research on ambidexterity becomes more and more complex and researchers employ the most sophisticated methods for its measurement and characterization through radical ideas or breakthrough technologies.

It must, therefore, be noted that there are still gaps in the theoretical and empirical framework of organizational ambidexterity that remain open to be addressed in future studies (Birkinshaw & Gupta, 2013; Raisch, Birkinshaw, Probst, & Tushman, 2009; Rosing, Frese, & Bausch, 2011; Tushman & O'Reilly, 2013). In reality, ambidexterity is hard to achieve (Birkinshaw & Gupta, 2013; Sarkees & Hulland, 2009). Even though literature on ambidexterity has increased exponentially in recent years, only few studies provide insights into how ambidexterity is managed at multiple organizational levels (Birkinshaw & Gupta, 2013; Paroutis & Pettigrew, 2007), what specific behaviors and leadership styles help in accomplishing ambidexterity (Havermans, Den Hartog, Keegan, & Uhl-Bien, 2015), and how organizational constraints influence ambidextrous leadership (Halevi, Carmeli, & Brueller, 2015).

The reason behind this scarcity is that organizational ambidexterity and ambidextrous leadership are multilevel constructs, and thus it is difficult to clarify how senior executives assign the responsibility for the simultaneous management of the tensions between exploration and exploitation at each of the levels (Birkinshaw

& Gupta, 2013). Consequently, in this study, a more comprehensive approach to ambidexterity management at multiple levels is provided through a qualitative research approach. In particular, ambidextrous leadership behaviors and management styles (micro-level) are monitored, as they penetrate to the middle management level (project managers) and further down to the employee level (meso-level), along with the challenges and tensions that are created and managed. Finally, the resulting global outlook of the organizations in terms of ambidexterity is evaluated (macro-level).

Moreover, researchers, in their attempt to describe the internal structure of organizations and how these organizations manage to balance ambidexterity, have proposed two dimensions: the temporal and the structural. The temporal dimension captures the extent to which ambidexterity is pursued simultaneously or sequentially over time, whereas the structural dimension captures whether ambidexterity takes place within independent or interdependent organizational units. Hence, if these two dimensions are combined, then four approaches to ambidexterity are generated: contextual, structural, punctuated (or punctuated equilibrium), and reciprocal ambidexterity (Simsek, Heavey, Veiga, & Souder, 2009; Wang & Rafiq, 2014).

Contextual ambidexterity is inherently challenging, as it includes the simultaneous pursuit of exploration and exploitation within the same business unit (Gibson & Birkinshaw, 2004; Wang & Rafiq, 2014). Structural ambidexterity, on the other hand, includes a dual structure composition, where exploration and exploitation are pursued in structurally independent units (Huang & Kim, 2013; Simsek et al., 2009; Tushman & O'Reilly, 1996). Punctuated equilibrium also includes long periods of

exploitation (relative stability) interrupted by short bursts of exploration within the same business unit (Gersick, 1991; Gupta, Smith, & Shalley, 2006; Romanelli & Tushman, 1994), while reciprocal ambidexterity includes the sequential pursuit of ambidexterity across separate units, where the output from exploration from one unit is the input for exploitation for the other unit (Simsek et al., 2009).

In this study, even though three of the four approaches to ambidexterity have been utilized in various combinations in the organizations under investigation, the main aim of this project was to focus on contextual ambidexterity (Wang & Rafiq, 2014), where senior executives, project leaders, and employees pursue explorative and exploitative activities simultaneously at each level. According to Birkinshaw & Gupta (2013), and based on Simon's (1962) argument, organizations are nearly decomposable systems, with parts that communicate with each other. Therefore, effectively managed organizations must have some blend of exploration and exploitation at each level, and thus ambidexterity should occur at multiple levels of the organization simultaneously, a fact that is confirmed by the findings of this research. Finally, it must also be stressed that contextual ambidexterity has been prescribed as the most pervasive approach (Andriopoulos & Lewis, 2009) in high technology organizations (Chandrasekaran, Linderman, & Schroeder, 2012).

1.2 Central research questions and methodology

In the course of this study, my multi-level analysis of ambidexterity and leadership in the aerospace and defense industry intends to investigate in depth, analyze research data, and provide answers to the following research areas and questions:

1. Micro-level: How are ambidextrous leadership principles executed and synchronized in the aerospace and defense organizations? What are the prevailing leadership styles?

2. Meso-level: How does organizational ambidexterity penetrate throughout the three levels of management (top, middle, and employee) in the aerospace and defense organizations? How critical is the same-level (horizontal) penetration? What tensions are created, and how are they managed?

3. Macro-level: How do aerospace and defense organizations use organizational ambidexterity to align their corporate strategy and structure with their external environment? How can these organizations be categorized in terms of their ambidexterity outlook?

It is within the aim of this study to clarify through a multilevel framework of how ambidexterity is managed at each of the organizational levels. In the framework of this research, therefore, ambidexterity is approached from three levels of analysis: individual (ambidextrous leadership) (Kassotaki, 2016a; Kassotaki & Kassotakis, 2016; Kassotaki & Paroutis, 2015), organizational, and industrial. Especially, how ambidexterity penetrates across the organizational levels is further analyzed (senior management level, middle management level, and employee level) (Kassotaki, 2016b). For instance, even though decisions about exploration and exploitation can take place at the senior management level, they still have to be implemented as projects by project leaders (middle management) and executed by employees (Chandrasekaran et al., 2012). Therefore, it is proposed that exploration–exploitation

activities can penetrate within organizations at the same level (horizontal ambidexterity), across levels (vertical ambidexterity), and through the entire organization (organizational ambidexterity).

It must be stressed that this study is based on a dual case study research framework (Yin, 2009). This design allows for each case to confirm or contradict the inferences drawn from the other case and to add confidence and generalizability to findings (Miles & Huberman, 1994; Yin, 2009). In this regard, the study involves two exploratory cases of leading organizations: on the one hand, one international organization, and on the other hand, three private, aerospace and defense companies. These organizations confront dual demands of exploring new products/processes and exploiting existing products/processes (Chandrasekaran et al., 2012), and thus they have the proper environment to study ambidexterity.

Moreover, the majority of the studies found in the ambidexterity literature are focused on consumer product industries (e.g. high-tech devices, pharmaceuticals etc.) or services (e.g. transportation, medical etc.), while aerospace and defense sectors are rarely considered. This is possibly due to the difficulties in accessing and compiling sufficient and credible amount of data, which had also been one of the challenges of this study. However, the gap of ambidexterity research in the field of aerospace and defense is more than worthy to be addressed, especially under the light of the emerging global security challenges, the war on terror, and the subsequent, vast capital investment by most of the nations.

Within this setting, this research was focused on firms with similarities that would facilitate comparisons and replication, yet it was done with sufficient heterogeneity to help assess potential generalizability (Andriopoulos & Lewis, 2009). All the above-mentioned companies offer services based on defense products and electronics, with engineering being one of the most important. Finally, these firms have a global presence and a multinational setting, and they exhibit diversity in size and age.

Data collection of this study was intensive, spanning more than two years. In the beginning, a thorough archival research of the companies under investigation was conducted. In the process, the data obtained from various sources was triangulated in order to understand, in depth, the organizational setting of the organizations under study (Heracleous & Werres, 2016). Multiple sources of evidence were used, such as (a) semi-structured, in-depth interviews, (b) archival data, and (c) observations (Yin, 2009). Finally, data from the investigation was supplemented with annual reports of the companies, as well as press releases and web material. In the section that follows, the structure of this thesis is analyzed in a greater detail.

1.3 Structure of the thesis

As shown in Figure 1.1, this thesis consists of nine chapters. Following the introduction, Chapter 2 describes the organizational ambidexterity concept. In the beginning, seminal research on ambidexterity is presented, then the study continues with the reference of all the factors that affect ambidexterity, and finally, it concludes with the analysis of this concept in much detail, in terms of structure, environmental dynamism, and influence on firm performance. In Chapter 3, the structure of

ambidexterity is examined at the following two levels of analysis: organizational and industrial. At the organizational level, this study presents how ambidexterity penetrates across multiple levels of management, and at the industrial level, it investigates how the top management teams of ambidextrous organizations make strategic choices to balance explorative and exploitative activities.

In Chapter 4, ambidextrous leadership is described, while taking into account the behavioral aspects of leadership in relation to ambidexterity. It must be stressed that ambidextrous leadership is considered to be the nucleus of any organization, including chief executive officers, boards of directors, and top management teams. In the same chapter, organizational and environmental constraints influencing ambidextrous leadership are also taken into account. In Chapter 5, the research methodology employed in this study is described in detail. Accordingly, the research context initially introduces the international organization and the three aerospace and defense companies under investigation. Then, the chapter concludes by presenting data collection methods and data analysis techniques.

Moreover, in Chapter 6, the internal and external structure and environment of both the international organization and the aerospace and defense companies are shown. In Chapter 7, interview findings are analyzed, which were retrieved from participants' responses to questionnaires in the international organization. Accordingly, in Chapter 8, interview findings are presented that were retrieved from the processing of the informant questionnaires in the aerospace and defense companies.

In Chapter 9, the study concludes with a cross-case analysis between the two case studies, as well as with the presentation of contributions to theory, research, and practice. Finally, the limitations of this study are also discussed and future directions are proposed in the field of ambidextrous leadership and organizational ambidexterity in general.

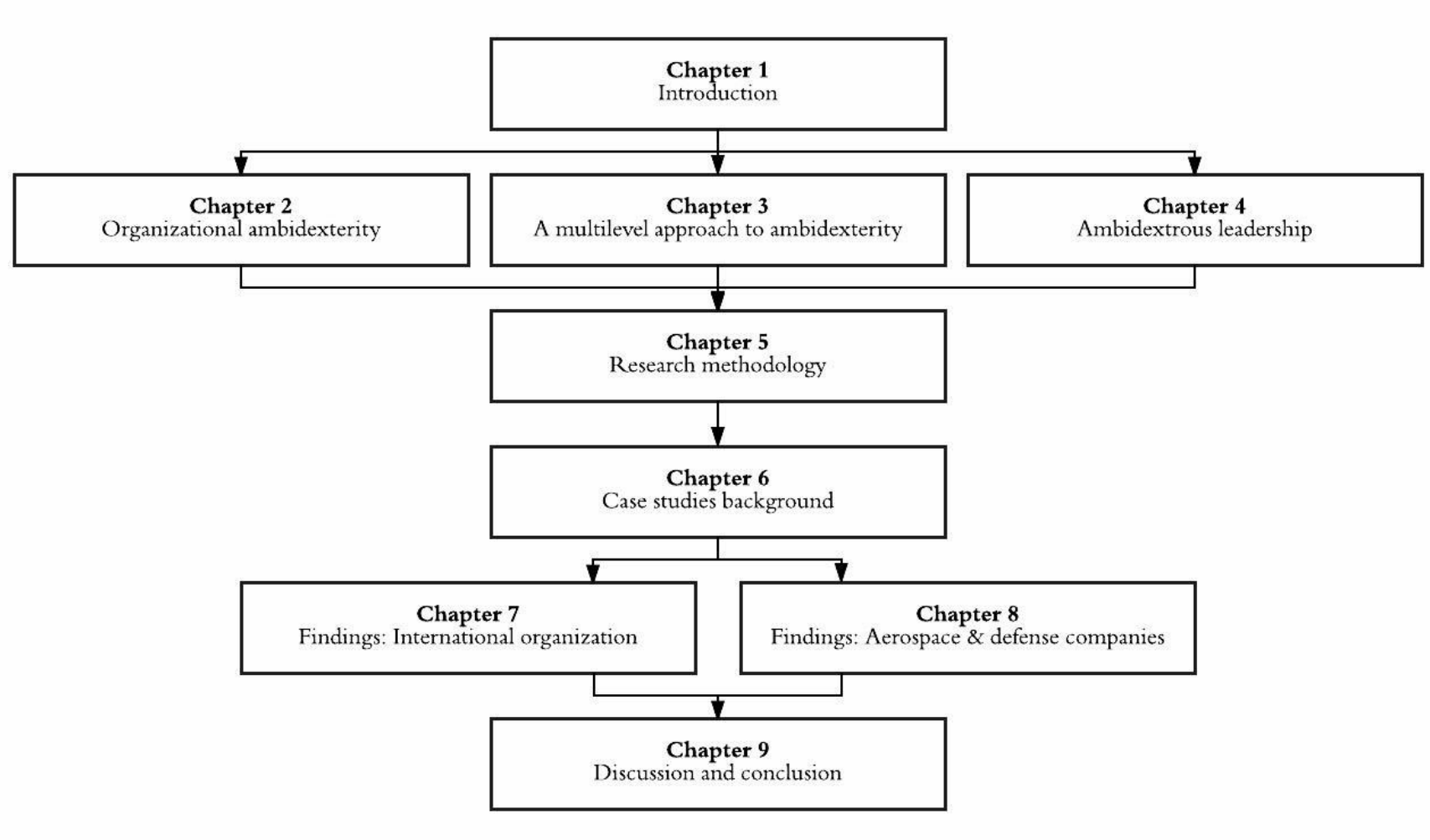

Figure 1.1: Structure of the thesis

CHAPTER 2

ORGANIZATIONAL AMBIDEXTERITY

2.1 Introduction

This chapter presents a detailed description of the organizational ambidexterity concept. In the beginning, seminal research on ambidexterity that appears in several literature streams is presented. Then, the framework of organizational ambidexterity is introduced and the factors, determinants, and moderators that may affect ambidexterity are presented. Subsequently, the concept of ambidexterity is analyzed in more detail in terms of structure, environmental dynamism, and influence on firm performance. Finally, the positive relationship between ambidexterity and firm performance is analyzed, the measurement of ambidexterity is discussed, and the classification of ambidextrous organizations is presented.

2.2 Theoretical foundations

Due to the ongoing business environment changes and new technological advances (Reeves, Haanes, Hollingsworth, & Scognamiglio Pasini, 2013), companies have to "keep running" as fast as needed in order just to stay in the game. Continuously improving competitor practices exposes companies to the danger of an imminent failure, whereas their competitive advantage depends primarily on the strength of their competencies and on the dynamism presented in their industry context (Heracleous, 2003). If firms manage to implement organizational ambidexterity, they

are more likely to achieve superior performance (Jansen, George, Van Den Bosch, & Volberda, 2008; Luo, Zheng, Ji, & Liang, 2016) compared to other firms that focus either on exploration or exploitation, as it becomes difficult for them to adapt to the ongoing environmental changes (Boumgarden et al., 2012; Raisch & Birkinshaw, 2008; Tushman & O'Reilly, 1996). March (1991), as well as Tushman & O' Reilly (1996) suggested that firms simultaneously pursuing both explorative and exploitative activities can achieve superior performance compared to firms emphasizing one at the expense of the other. Firms that mainly pursue exploitation achieve returns that are predictable but not necessarily sustainable. They may enhance their short-term performance but that may result in a competence trap, as they may not be able to respond adequately to environmental changes. On the contrary, scholars have long argued that firms' ability to compete successfully in the long run may be rooted in their ability to jointly pursue exploration and exploitation, with ambidexterity being a key driver for their long-term performance. Therefore, firms must pursue an optimal mix of exploration and exploitation in order to remain competitive both in the short- and long-term (Gibson & Birkinshaw, 2004; Junni et al., 2013; Luo et al., 2016).

In their attempt to resolve the above apparent contradiction, researchers have moved towards different directions, producing literature streams related to organizational ambidexterity (Junni et al., 2015; Knight & Paroutis, 2017a; Raisch & Birkinshaw, 2008). They have been attempting to explain ambidexterity in the context of organizational learning (Argyris & Schön, 1978; Kostopoulos & Bozionelos, 2011; March, 1991; Prieto-Pastor & Martin-Perez, 2015), technological innovation (O'Reilly & Tushman, 2004; Smith et al., 2017), organizational adaption (Gupta et

al., 2006; Markides & Charitou, 2004; Tushman & O'Reilly, 1996), strategic management (Burgelman, 2002; Heracleous, 2013; Heracleous & Wirtz, 2009; Papachroni et al., 2015), and organizational design (Gibson & Birkinshaw, 2004; Markides & Charitou, 2004; Tushman & O'Reilly, 1996).

In that respect, in the stream of organizational learning, ambidexterity is perceived as two types of learning (exploration–exploitation/single loop-double loop) balanced for long-term organizational success. Here, ambidexterity is pursued simultaneously, and the more the managers obtain top-down and bottom-up knowledge inflows, the higher the level of ambidexterity in which they engage (see also the recent work of Zimmermann et al. 2015). In the stream of technological innovation, ambidexterity is perceived as a reflection of the challenges of the simultaneous pursuit of incremental (exploitative) and radical (explorative) innovations in the organizational setup. Again, in this stream, we are dealing with a simultaneous pursuit of ambidexterity in independent units, where combined exploration–exploitation innovations reflect complex capabilities that provide additional corporate advantage beyond those provided by each innovation separately.

Moreover, in the stream of strategic management, ambidexterity is perceived as variation-reducing (induced) and variation-increasing (autonomous) strategic processes, with their combination being the most beneficial for organizations. Here, ambidexterity is pursued simultaneously, where leaders must make successful trade-offs between two strategic processes that compete for scarce resources, whereas the combination of these processes could be the most beneficial to organizations. In the same vein, in the stream of organizational design, ambidexterity is perceived as the

challenge posed by the trade-off between efficiency (mechanistic/centralized/hierarchical structure) and flexibility (organic/decentralized/autonomous structure) in a complex organizational design for short-term efficiency and long-term innovation. Here, we are also dealing with a simultaneous pursuit of ambidexterity in independent units, where mechanistic and organic structures are difficult to achieve within a single firm; however, their combined, flexible structures lead to the generation and better use of innovations.

Finally, in the stream of organizational adaption, ambidexterity is comprised of long periods of convergence (evolutionary change), punctuated by short periods of discontinuous (revolutionary) change for long-term organizational success. Here, we are dealing with a sequential pursuit of ambidexterity in independent units, where too many change actions may lead to organizational chaos, whereas the opposite might cause inertia. Table 2.1 shows some seminal work on organizational ambidexterity as developed by Raisch & Birkinshaw (2008).

Table 2.1: Seminal research on organizational ambidexterity (developed from Raisch & Birkinshaw, 2008, pp. 377-380 and Papachroni et al., 2015, pp. 3-4)

Type	Literature stream	Typology of ambidexterity	Ambidexterity concept	Key challenges for a successful ambidexterity management
Organizational ambidexterity: Initial contribution				
• Organizational learning ambidexterity **Key author(s):** 1. Argyris & Schön, 1978 2. March, 1991 3. Gupta et al., 2006 4. Mom, Van Den Bosch, & Volberda, 2007	Organizational learning	Simultaneous pursuit of ambidexterity	Ambidexterity perceived as two types of learning (exploration–exploitation/single loop-double loop) balanced for long-term organizational success	The more a manager obtains top-down and bottom-up knowledge inflows, the higher the level of ambidexterity in which he engages.
Evolution of organizational ambidexterity				
• Structural ambidexterity	Technological innovation	Simultaneous pursuit of ambidexterity in	Ambidexterity reflects the challenges of the simultaneous pursuit of incremental (exploitative) and radical	Combined exploration–exploitation innovations reflect complex capabilities that

Key author(s): 1. Tushman & O'Reilly, 1996 2. Tushman & Smith, 2002 3. Benner & Tushman, 2003 4. O'Reilly & Tushman, 2004		interdependent units	(explorative) innovations in the organizational setup	provide additional corporate advantage beyond those provided by each innovation separately
• Strategic ambidexterity **Key author(s):** 1. Burgelman, 2002 2. Markides & Charitou, 2004 3. Markides & Oyon, 2010	Strategic management	Simultaneous pursuit of ambidexterity	Ambidexterity includes variation-reducing (induced) and variation-increasing (autonomous) strategic processes, with their combination being the most beneficial for organizations	Leaders must make successful trade-offs between two strategic processes that compete for scarce resources, whereas the combination of these processes could be the most beneficial to organizations
• Contextual ambidexterity	Organizational design	Simultaneous pursuit of ambidexterity in	Ambidexterity perceived as the challenge of the trade-off between efficiency	Mechanistic and organic structures are difficult to achieve within a single firm,

Key author(s): 1. Tushman & O'Reilly, 1996 2. Gibson & Birkinshaw, 2004 3. Jansen, Volberda, & Van Den Bosch, 2005		independent units	(mechanistic/centralized/hierarchical structure) and flexibility (organic/decentralized/autonomous structure) in a complex organizational design for short-term efficiency and long-term innovation.	however their combined flexible structures lead to the generation and better employment of innovations
• Organizational ambidexterity or punctuated equilibrium **Key author(s):** 1. Huy, 2002 2. Gupta et al., 2006	Organizational adaption	Sequential pursuit of ambidexterity in independent units	Ambidexterity comprised of long periods of convergence (evolutionary change) punctuated by short periods of discontinuous (revolutionary) change for long-term organizational success	Too many change actions may lead to organizational chaos, whereas the opposite could cause inertia

2.3 A framework of organizational ambidexterity

Despite the massive volume of research produced on different elements of organizational ambidexterity, still less clarity exists on how organizations achieve ambidexterity (Birkinshaw & Gupta, 2013; Raisch & Birkinshaw, 2008). Over the past decade, researchers have stressed upon the factors that may affect organizational ambidexterity, such as environmental dynamics, organizational structures, behavioral contexts, and leadership characteristics, that contribute to the successful implementation of ambidexterity (see Figure 2.1). All the above moderators were analyzed in relation to performance metrics and the degree of their influence on organizational ambidexterity (Junni et al., 2013). In this regard, most of the studies are mainly focused on structural factors and on the effect of ambidexterity on firm performance, whereas reference to other factors and more complex relationships that address additional variables are rather scarce (Raisch & Birkinshaw, 2008).

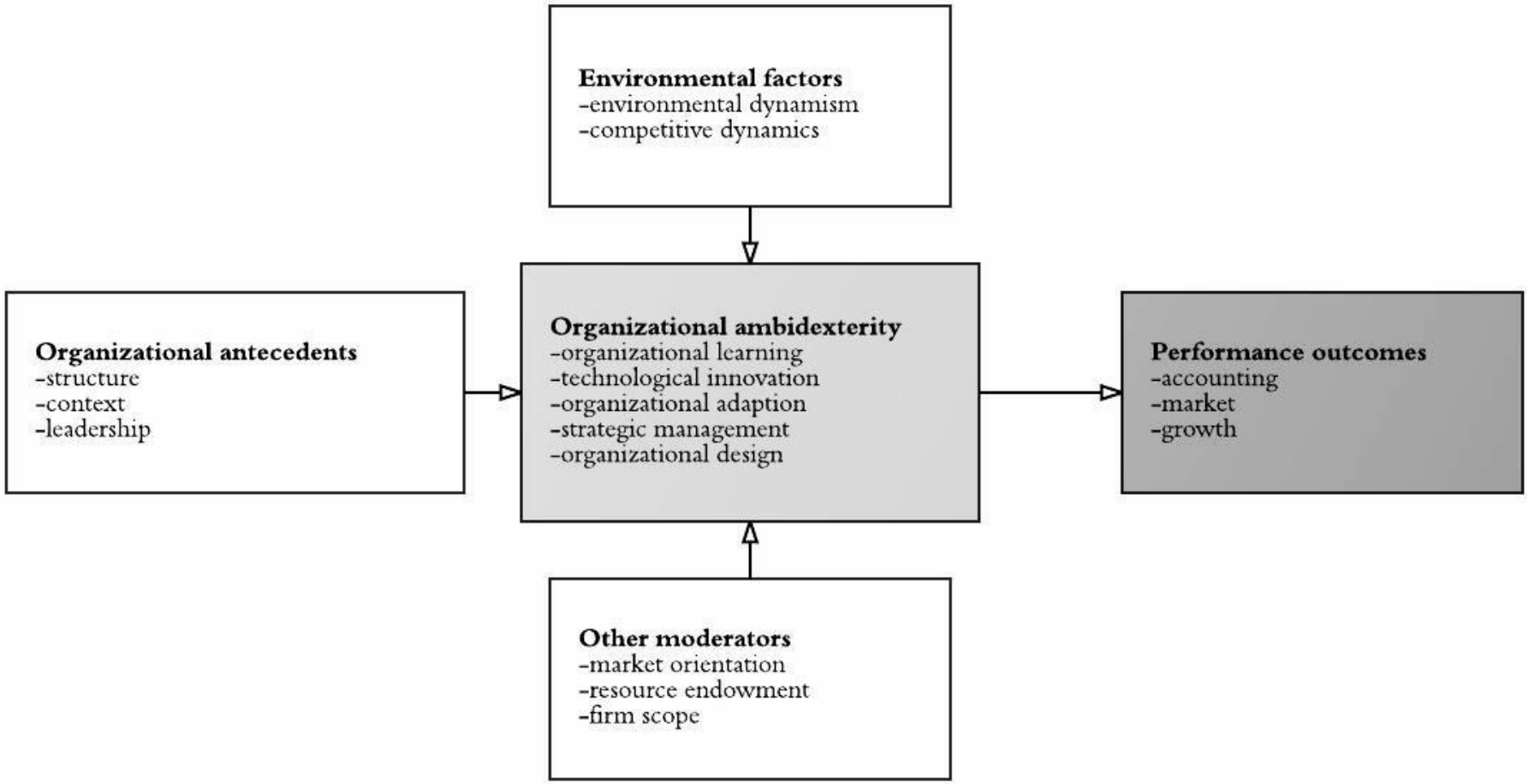

Figure 2.1: A framework of organizational ambidexterity (developed from Raisch & Birkinshaw, 2008, p.381)

Taking into account the above context, research has shown that organizational ambidexterity reaps the greatest performance effects in extremely dynamic environments (Junni et al., 2013). Such environments include knowledge-intensive services (such as higher education organizations), high-technology sectors (e.g. research and biotech), airline industries (such as Singapore Airlines), and cultural (e.g. art movies) and professional (e.g. medicine and law) industries (Andriopoulos & Lewis, 2009; Heracleous, 2013; Simsek et al., 2009; Tushman & O'Reilly, 2013). In dynamic markets, firms continuously need to innovate, while being effective in their organizational setup because the duration of a competitive advantage is very uncertain. On the contrary, more stable markets may be more forgiving (Junni et al., 2013), where firms may have long periods of exploitation and short bursts of exploration or vice versa (Gupta et al., 2006).

Further, different suggestions have been proposed on how organizations should balance explorative and exploitative activities to resolve contradicting requirements (Raisch & Birkinshaw, 2008; Tushman & O'Reilly, 2013). The first model has to do with *sequential* ambidexterity, where organizations can temporarily cycle through periods of exploration and periods of exploitation (O'Reilly & Tushman, 2008). The second model is called *structural* ambidexterity, where companies can use simultaneously separate subunits, one for exploration and another for exploitation (Markides & Charitou, 2004; O'Reilly & Tushman, 2004). The last proposition is called *contextual* ambidexterity, and it has to do with simultaneous balance of exploration and exploitation through alignment of two opposites within the same business unit. In this case, organizational ambidexterity is strategically integrated

into a common set of values, a shared vision, and an overarching governance process (Gibson & Birkinshaw, 2004).

Beyond the environmental and structural factors, researchers have stressed their attention on other moderators that influence organizational ambidexterity, such as market orientation, resource endowment, and firm's scope (Raisch & Birkinshaw, 2008). Market orientation increases firm's capability to respond to current and future customers' needs (Kyriakopoulos & Moorman, 2004). Resource endowment relates to the amount of resources that a firm possesses, as limited resources can restrain organizations from pursuing organizational ambidexterity. In that respect, young firms may benefit more from a one-sided orientation than from a mixed strategy (Cao, Gedajlovic, & Zhang, 2009; Lubatkin, Simsek, Ling, & Veiga, 2006).

Finally, according to Junni et al. (2013), organizational ambidexterity is positively and significantly associated with organizational performance. This is in line with Tushman & O'Reilly's (1996) suggestion that firms that simultaneously pursuit exploration and exploitation achieve superior performance in comparison to firms that use one strategy at the expense of the other. Tushman & O'Reilly's (1996) further support, in accordance with other researchers, that ambidexterity is positively associated with sales growth (Derbyshire, 2014; He & Wong, 2004), measurable ratings of performance (Cao et al., 2009; Lubatkin et al., 2006), innovation (He & Wong, 2004), market evaluation as measured by Tobin's Q factor (Uotila, Maula, Keil, & Zahra, 2009), and firm survival (Tushman & O'Reilly, 2013).

To sum up, the existing literature on ambidexterity has proposed and tested the relationships between the most important factors that may affect ambidexterity. There are, therefore, relationships between the antecedents, moderators and outcomes of organizational ambidexterity (Raisch & Birkinshaw, 2008), as referred in Figure 2.1. However, Raisch & Birkinshaw (2008) have also mentioned in their research that at a first glance, ambidexterity antecedents, moderators and environmental factors have been conceptualized as the most significant agents that play a major role on ambidexterity. However, more in depth studies have revealed that there are also other important issues affecting the interrelations between factors (Junni et al., 2015), such as top team's strategic intent (Andriopoulos & Lewis, 2009), leadership vision and values, and an aligned senior team with the ability to manage ambidexterity (Chandrasekaran et al., 2012; Heyden, Sidhu, & Volberda, 2015).

In addition, Raisch & Birkinshaw (2008) have argued in their study that recently scholars have also started to study internal and external conditions of the effects of ambidexterity on performance. Based on the conclusions of these studies, they note that it is important to consider multiple performance dimensions, as studies using one-dimensional indicators may run the risk of producing biased estimations of ambidexterity on firms' overall success. They stress, therefore, upon the importance of considering ambidexterity's both short-term and long-term performance implications, as explorative activities become obvious in the long run, whereas exploitative behaviors become apparent only in the short run (see also March 1991).

2.4 A typology of organizational ambidexterity

For a better understanding of ambidexterity and describing the internal structure of ambidextrous organizations and how they manage to balance ambidexterity, in this section, the following two dimensions are used: time and space. Time dimension captures the extent to which ambidexterity is pursued simultaneously or sequentially over time, whereas space dimension captures whether ambidexterity takes place within independent or interdependent organizational units (Simsek et al., 2009). An illustration of the above concept is presented in Figure 2.2 below:

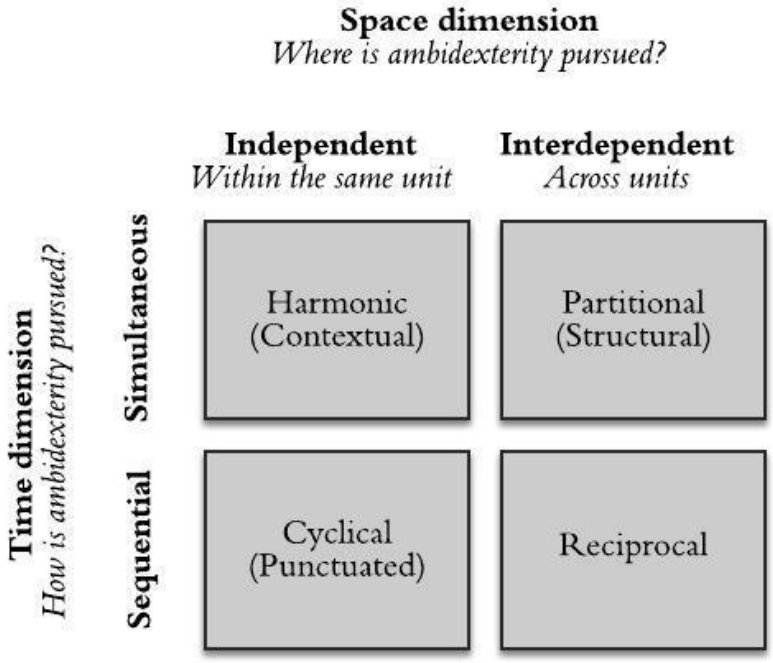

Figure 2.2: A typology of organizational ambidexterity (developed from Simsek et al., 2009, p. 868).

Harmonic/contextual ambidexterity is inherently challenging, as it includes the simultaneous pursuit of exploration and exploitation within the same business unit. This involves building a set of processes or systems so that individuals could make their own judgments on how to divide their time between conflicting demands (Gibson & Birkinshaw, 2004). From a managerial perspective, it necessitates leaders

to have complex, ambidextrous behaviors in the organizational roles that they encounter (Andriopoulos & Lewis, 2009; Raisch & Birkinshaw, 2008). From a resource-based view, harmonic ambidexterity is a potential source of competitive advantage, as it is valuable, rare, and costly to imitate. It is also positively associated with stakeholder satisfaction, middle and senior level managers' performance, as well as strategic performance. The difficulty, however, of such an approach lies in that the implementation of ambidexterity in systems and processes is costly to achieve (Gibson & Birkinshaw, 2004; Simsek et al., 2009).

Partitional/structural ambidexterity includes a dual structure composition, where exploration and exploitation are pursued in structurally independent units (Huang & Kim, 2013), with each one having its own strategies, structures, cultures, and incentive systems. It is an interdependent, simultaneous phenomenon that involves ambidexterity within different structural units or divisions of one or more organizations. Each unit houses its own distinct management team, organization structure, culture, control systems, and incentive structures that have an independent or organizationally interdependent operation, coordinated by actions of a senior management team (Figure 2.3) (Tushman & O'Reilly, 1996). It is used in financial services firms or firms with strategic alliances and inter-firm networks. The integration of exploration and exploitation across separate domains constitutes a major challenge that can be addressed through a shared vision (Jansen et al., 2008; O'Reilly & Tushman, 2004), senior management team coordination (Lubatkin et al., 2006), and systems for knowledge integration. It can, then, be closely associated with increased innovation and high financial performance (Simsek et al., 2009).

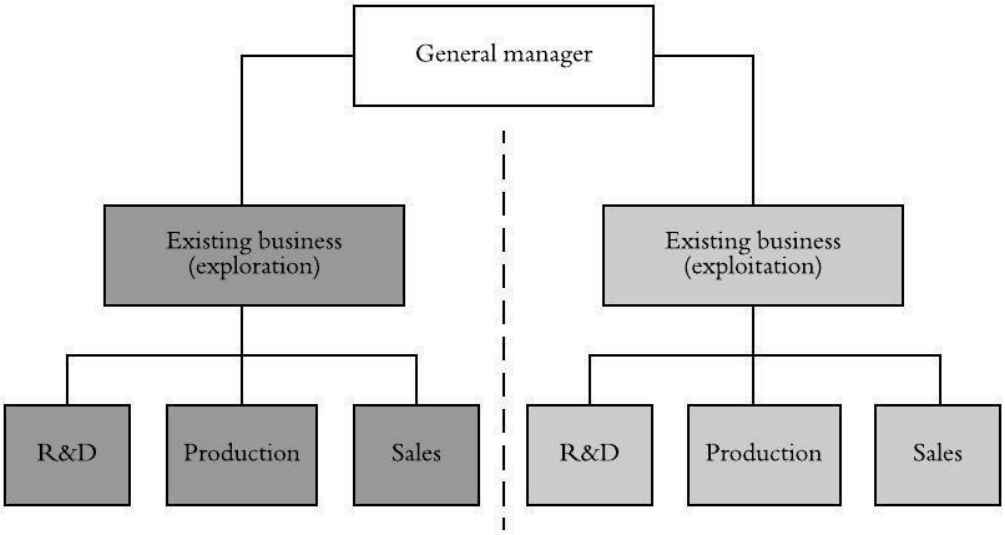

Figure 2.3: Partitional or structural ambidexterity (developed from Blarr, 2012, p. 78)

Cyclical ambidexterity or punctuated equilibrium (Lant & Mezias, 1992; Papachroni et al., 2015; Smith et al., 2017; Wang & Rafiq, 2014) includes long periods of exploitation (relative stability) interrupted by short bursts of exploration within the same business unit (Figure 2.4) (Gersick, 1991; Gupta et al., 2006; Romanelli & Tushman, 1994; Siggelkow & Levinthal, 2003; Tushman & O'Reilly, 1996). As a result, it requires changes in the formal structure and routines, practices and procedures of reward and control, and resource allocation. For this reason, mechanisms for management conflict, effective interpersonal relations, flexibility, and switching rules constitute the primary feature of this ambidexterity. It is mostly used in firms with strong technological and R&D orientation, such as biotechnology or software firms (Simsek et al., 2009). These firms follow an S-shaped curve, where they first engage in exploration to discover new knowledge, and then, they focus on exploitation to develop and commercialize that knowledge. Hence, they are strongly

associated with innovative outcomes and increased performance through innovation (Simsek et al., 2009).

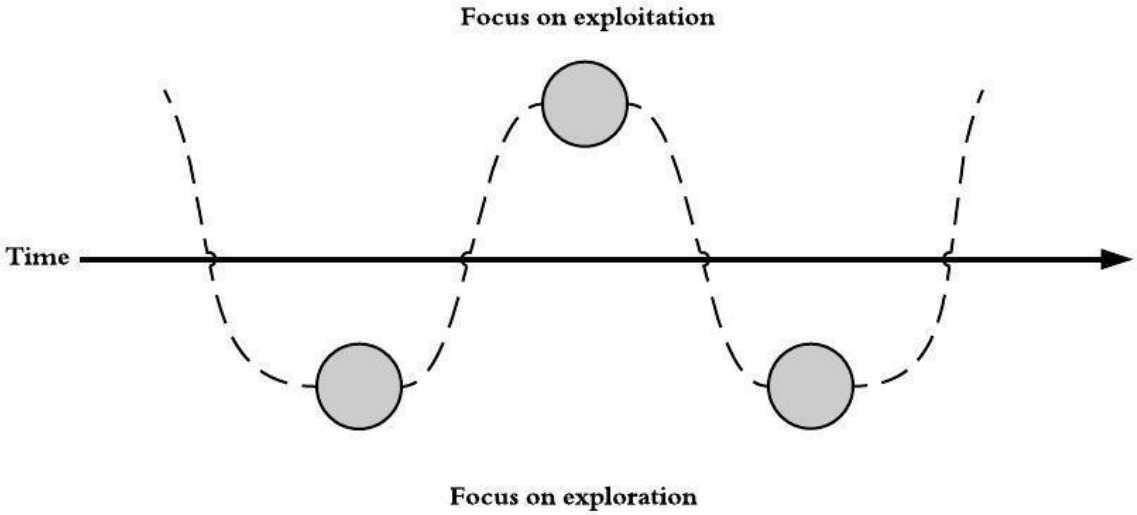

Figure 2.4: Cyclical ambidexterity or punctuated equilibrium (developed from Blarr, 2012, p. 68)

Reciprocal ambidexterity includes the sequential pursuit of ambidexterity across separate units. In this type, the outputs from exploration from unit B become the inputs for exploitation by unit A, and the outputs from unit A cycle back to become the inputs of unit B (Figure 2.5) (Simsek et al., 2009). This type of ambidexterity requires an ongoing information exchange, collaborative problem solving, joint decision-making, and resource flows between managers of different units. Reciprocal ambidexterity is used between organizations that engage in formal strategic alliances or processes of internationalization, as they operate in complex environments that require proper knowledge integration among the alliance partners. Most importantly, a proper exploratory and exploitative knowledge sharing in long-term inter-organizational relationship could be positively associated with increased relationship performance (Simsek et al., 2009).

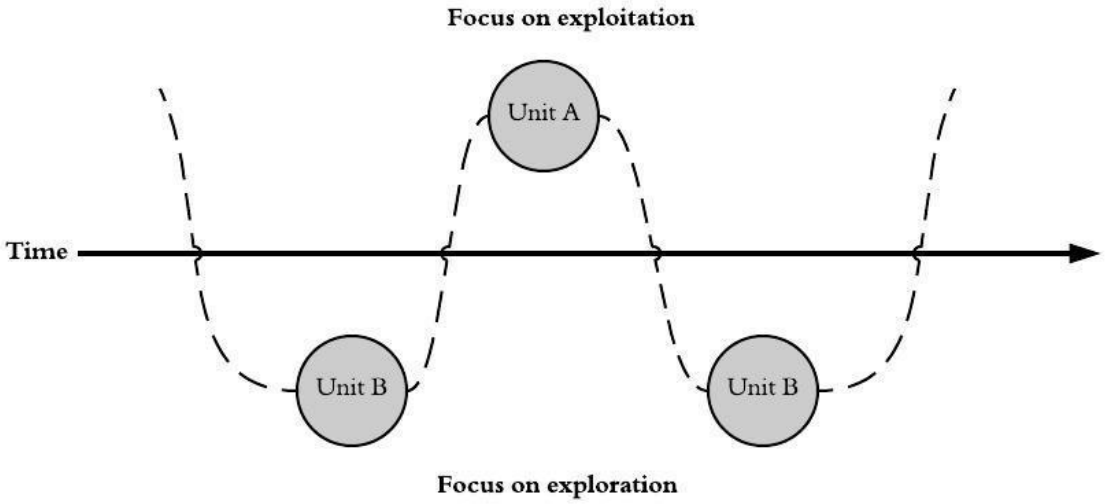

Figure 2.5: Reciprocal ambidexterity

All the above approaches are not seen strictly as alternatives (Kauppila, 2010; Papachroni et al., 2015). Firms are expected to utilize various combinations while seeking to better employ ambidexterity in their organizational context (Hill & Birkinshaw, 2014; Turner, Swart, & Maylor, 2013). They are, therefore, expected to pursue *hybrid* forms of organizational ambidexterity or hybrid ambidexterity. However, firms are expected to mostly focus on simultaneous use of exploration and exploitation that results in supreme corporate performance. In this regard, high-tech companies, for instance, are expected to pursue organizational ambidexterity in the same unit, as well as in different units. At the same time, as the external environment changes, it is possible that they initially pursue innovation and then try to achieve cost efficiency. Thus, a few or all the four types of organizational ambidexterity are likely to occur in both high-tech oriented units, as well as in non-technologically oriented units (Boumgarden et al., 2012; Nickerson & Zenger, 2002).

2.5 Organizational ambidexterity and environmental dynamism

A key characteristic of organizational ambidexterity is that it is positively and significantly associated with environmental dynamism (Boumgarden et al., 2012; Davis, Eisenhardt, & Bingham, 2009). Ambidexterity is found to be more important for firms that operate in dynamic environments, such as high-tech and knowledge-intensive service firms, rather than in manufacturing industries. In dynamic markets, firms need to continuously search for new opportunities, as the competition is intense, while carefully exploiting the scarce financial and human resources. In contrast, in more stable markets, firms could use longer periods of stability followed by short bursts of change (Davis et al., 2009). Thus, they may focus on exploitation for longer periods before paying attention on exploration, even though ambidexterity is still needed to be used interchangeably rather than simultaneously (Jansen et al., 2005; Junni et al., 2013; Raisch & Birkinshaw, 2008).

Moreover, difficulties arise not only when firms encounter scarce human and/or financial resources, but also when organizations exhibit different organizational and/or environmental conditions, such as recession, turnaround, or firm mergers (Marquis & Tilcsik, 2013). Organizations may experience multiple such periods over time. For instance, a firm may go public, merge with another firm, or have a massive reorientation, and thus suddenly face new environmental demands. As a result, the organization must define or adjust exploration and exploitation activities in order to remain confined to the scope delineated by its organizational form (Boumgarden et al., 2012).

Ambidexterity can also be approached in terms of environmental munificence in order to describe industrial opportunities and dynamism (Davis et al., 2009; Raisch & Hotz, 2010). In times of low environmental munificence, ambidexterity fails to significantly affect firm performance. However, in times of increasing environmental munificence (with scarcity of critical resources), firms might benefit from organizational ambidexterity resulting in superior short-term performance (see also Auh & Menguc, 2005). Again, as the complexity, plurality, and competitiveness of the environment grows, organizations experience increased pressures to simultaneously deal with multiple competing demands in their organizational environment (Smith, 2014).

2.6 Ambidexterity and organizational performance

2.6.1 Ambidexterity–performance relationship

Researchers have expressed opposing views about ambidexterity and its impact on organizational performance. On the one hand, Porter (1996) suggested that firms must pursue either differentiation or low cost strategy, whereas their simultaneous pursuit compromises their potential value and results in them being “stuck in the middle” (Papachroni et al., 2015). In the same vein, some researchers suggest that firms need to make choices that favor exploration over exploitation. On the other hand, March (1991) believes that firms that pursue exploration and exploitation simultaneously are more likely to achieve superior performance. This is in line with Tushman & O’Reilly's (1996) opinion that firms that pursue exploration at the expense of exploitation run the risk of ending up having low organizational performance.

The above arguments have led to the "ambidexterity premise", according to which an organization that uses only exploration will normally suffer from the fact that it never gains the returns on its knowledge. On the other hand, an organization that uses only exploitation will normally suffer from obsolescence (Bonesso, Gerli, & Scapolan, 2014; Levinthal & March, 1993). Research of the ambidexterity–performance relationship has been tested in different contexts, such as in manufacturing firms and high-tech firms (He & Wong, 2004), multinational enterprises (Han, 2007), small and medium-sized enterprises (Lubatkin et al., 2006), and on different levels, such as on firm level and business unit level (Gibson & Birkinshaw, 2004), in projects (Rosenkopf & Nerkar, 2001), on the team level (Cao et al., 2009; Huang & Cummings, 2011) and on the individual level (Kammerlander, Burger, Fust, & Fueglistaller, 2015; Mom, Van Den Bosch, & Volberda, 2009). Most of the studies showed a positive relationship of organizational ambidexterity with sales growth (Derbyshire, 2014; He & Wong, 2004), profitability (Fiss, 2011), return on investment and market share (Hambrick, 1983), and short-term and long-term firm performance (Mahr, 2010; Schmitt & Raisch, 2013; Zimmermann et al., 2015).

More recently, Junni et al. (2013) used a meta-analysis to define the organizational ambidexterity–performance relationship. They found that ambidexterity is important for performance in non-manufacturing firms and at the higher levels of analysis. They also found that the performance effects are stronger when the study uses a cross-sectional or multi-method research design. In Table 2.2 below, some key studies are presented, where scholars define the positive relationship between ambidexterity and performance.

Table 2.2: Key studies about the positive relationship between ambidexterity-performance

Author(s)	Year	Level of analysis	Type of research	Measurement of performance	Key findings
He & Wong	2004	Manufacturing and high-tech firms	Quantitative	Sales growth	• The interaction between explorative and exploitative innovation strategies is positively related to sales growth rate • The relative imbalance between explorative and exploitative innovation strategies is negatively related to sales growth rate
Lubatkin et al.	2006	Small- to medium-sized enterprises (SMEs)	Multisource survey	Top management team (TMT) behavioral integration	• No other group, including the board of directors, has as great a potential for affecting the form and fate of an organization as the small group of senior executives residing at the apex of the organization
Han & Celly	2008	Multinational enterprises (INVs)	Quantitative	• Profit (ROI) • Growth (market share)	• Firms that looked at the long-term, profit-growth strategy enjoyed better performance than firms that adopted only one or none of the strategies
Cao et al.	2009	Small- to medium-sized enterprises (SMEs)	Quantitative	• Growth (sales, profit, market share) • Operational efficiency • Cash flow • Market reputation	• The concurrent high levels of the balance dimension of ambidexterity (BD) and the combined dimension of ambidexterity (CD) yield synergetic benefits and are over and above their independent effects • BD is more beneficial to resource-constrained firms, whereas CD is more beneficial to firms having great access to internal and/or external resources
Sarkees &	2009	Publicly-traded	Cross industry	• Revenues	• Firms that successfully employ an ambidextrous

Hulland		firms	survey	• Profits • Customer satisfaction • New product introductions	strategy outperform those, which overemphasize either efficiency or innovation.
Blarr	2012	Small- to medium-sized firms (SMEs)	Quantitative	• ROA • ROE • Perceived performance as compared to competitors, and compared to the industry average	• The higher the level of organizational ambidexterity, the better the firm performance
Boumgarden et al.	2012	Firm (or multi-business level) and business unit level	Dual case study analysis	Expected economic profitability	• Vacillation may offer higher long run performance than ambidexterity, while ambidexterity enhances performance on the margin when utilized within larger epochs of vacillation • Ambidexterity and vacillation are complements with respect to performance
Junni et al.	2013	Multiple	Meta-analysis	–	• Cross-sectional surveys and multi-method studies showed stronger performance effects • Subjective performance measures had stronger performance effects than objective ones • Weaker performance impact in manufacturing industries

More specifically, in the Table 2.2, the levels of analysis that researchers have used in their studies are presented. These levels vary and include small- to medium-sized firms (SMEs), multinationals, different industries such as manufacturing and high-tech firms, publicly traded firms, among others. Types of research also vary, which may involve qualitative, quantitative, or multi-source surveys, meta-analysis studies etc. Most of the studies show positive outcomes of ambidexterity on performance. Most importantly, scholars examine internal and external conditions, which they suggest that have positive effects through their relationship with ambidexterity on firm performance.

The analysis of some current studies follows, in order to explain what are the latest findings that contribute to a better understanding of a positive relationship between ambidexterity and firm performance. For instance, while considering various well-known determinants and moderators, which may influence and reinforce the positive relationship of ambidexterity with firm performance, Hahn et al. (2016) approach the issue of ambidexterity–performance relationship from a different angle and propose, in their recent study, that ambidexterity represents an important determinant of corporate social performance (non-financial performance). The researchers also explain how firms achieve higher levels of corporate social performance through the ambidextrous ability to simultaneously pursue instrumentally and morally driven social initiatives. They distinguish between a balanced dimension and a combined dimension of ambidexterity. With the balanced dimension, instrumental and moral initiatives compensate for each other, which increases the scope of corporate social performance. With the combined dimension, instrumental and moral initiatives supplement each other, which increases the scale of corporate social performance.

They conclude that by focusing on the interplay and tensions between different types of social initiatives and through the use of an ambidextrous perspective, we can better understand how ambidexterity contributes to the improvement of corporate social performance.

Parida et al. (2016), in their latest study on entrepreneurial firms, discuss the moderation effects that firm size and environmental dynamism play on firm performance. The researchers found evidence for the effects of lower performance variability in dynamic environments, as environmental dynamism is considered a contingency where performance variance is problematic for entrepreneurial firms. The researchers also suggest that entrepreneurial firms should carefully examine how much they should explore and how much they should exploit, and this is particularly important for young firms that are exposed to dynamic environments.

Finally, Rosing & Zacher (2016), in their recent study on individual ambidexterity, discuss that ambidexterity is important for firm performance not only at the organizational, but also at the individual level. In their work, they use a polynomial regression and a response surface methodology to prove that individuals need to utilize an optimal balance of explorative and exploitative behaviors, while also studying how these individuals can operationalize ambidexterity in order to facilitate an innovative performance in organizations.

2.6.2 Measurement of ambidexterity and performance

Additionally, in relation to the measurement of organizational ambidexterity, it must be emphasized that the measures of ambidexterity differ considerably across studies.

Ambidexterity instruments are constructed according to how scholars perceive ambidexterity as balanced or combined. Within both categories, researchers use different mathematical variations (e.g. addition and multiplication within the combined ambidexterity perspective, such as |exploration*exploitation|). Most of ambidexterity scholars have a specific preference towards ambidexterity measurement, but there is no conclusive evidence whether these different measures produce consistent results (Junni et al., 2013).

With respect to performance measures in ambidexterity studies, these are classified into objective and perceptual. The objective measures have to do with growth and profitability of organizations under examination, whereas the perceptual measures have to do with whether performance is considered absolute or relative as compared to that of competitors (Junni et al., 2013). For example, Gibson & Birkinshaw (2004), in their study, measured perceptual performance of the business unit, while Lubatkin et al., (2006), in their research, measured perceptual performance as compared to that of industry competitors.

2.6.3 Classification of ambidextrous organizations based on their performance

Finally, even though ambidexterity literature is extremely vague about how two different objectives should be balanced, traded off against one another, reconciled, or just managed (Faisal Ahammad, Mook Lee, Malul, & Shoham, 2015), Birkinshaw & Gupta (2013) propose that some firms are likely to be more ambidextrous than others, while it seems improbable for a firm to deliver the highest level of achievement on both dimensions simultaneously.

Boumgarden, Nickerson, & Zenger (2012) argue that ambidexterity theory is unclear in explicitly defining the relationships among exploration, exploitation, and firm performance. Still, they propose a three-dimensional representation of the relationship among these three variables, according to which ambidextrous organizations may have high performance outcomes provided that they produce an approximate balance of exploration and exploitation activities (see also Junni et al. 2013). On the contrary, if ambidextrous companies are comprised of inconsistent design elements, the greater the distance from a balanced ambidextrous structure, the lower the level of their performance. In fact, organizations seem to appear in optimal exploration–exploitation clusters, and any organization that adopts organizational form deviating from these clusters presents lower performance and a diminished probability of survival.

In the same vein, Riccaboni & Moliterni (2009) argue that organizations able to effectively combine exploration and exploitation occupy a stable position at the core of the network structure and enjoy a competitive advantage (Hahn et al., 2016; Junni et al., 2013; Turner et al., 2013). Figure 2.6 below presents an illustration of the aforementioned framework.

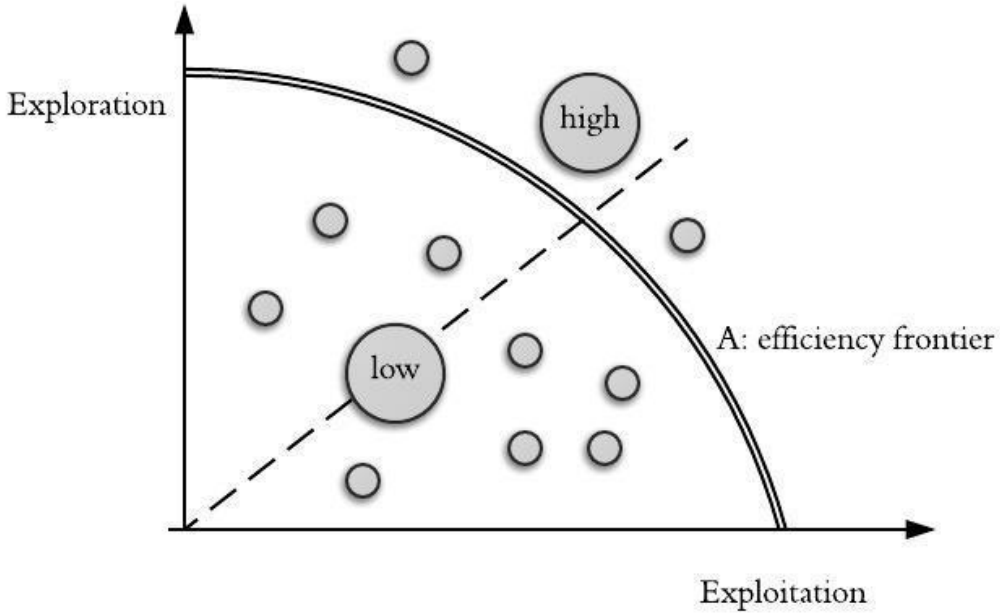

Figure 2.6: Classification of ambidextrous organizations (developed from Birkinshaw & Gupta, 2013, p. 295)

2.7 Summary

In summary, in this chapter, organizational ambidexterity is approached from different angles, and in relation to literature streams on organizational ambidexterity, different moderators that affect ambidexterity, and thus firm performance, are presented, four ambidexterity approaches appearing in ambidextrous organizations are described in detail, relationships between ambidexterity and environmental dynamism are analyzed, and finally ambidexterity measurement and ambidextrous organizations classification are introduced. More specifically, the chapter starts with a broad reference to ambidexterity and how the concept is studied in different literature streams, such as in organizational learning, technological innovation, strategic management, organizational design, and organizational adaption as referred in the study of Raisch & Birkinshaw (2008).

Then, a framework of organizational ambidexterity is presented, where different moderators that affect ambidexterity are analyzed, which in turn have a major impact on firm performance. Such moderators are environmental dynamics, organizational structure, behavioral contexts, and leadership characteristics, and some other secondary but important issues, such as top team strategic intent, internal and external organizational conditions, and multiple performance dimensions are discussed. In the section that follows, four approaches to ambidexterity are introduced, based on the work of Simsek et al. (2009). These are the following: contextual ambidexterity, which includes the simultaneous pursuit of ambidexterity; structural ambidexterity, where exploration and exploitation are pursued in structurally independent units; punctuated equilibrium, which includes long periods of exploitation interrupted by short bursts of exploration; and reciprocal ambidexterity, which deals with the sequential pursuit of ambidexterity across separate units. It should be mentioned that firms are expected to utilize various combinations of the above approaches, but in this study, the focus is mainly stressed on contextual ambidexterity.

The description of the interaction of organizational ambidexterity with environmental dynamism follows. Most of the scholars agree that ambidexterity is more important for firms that operate in dynamic environments, such as in high technology and knowledge intensive services and in difficult environmental conditions, such as during recessions, turnarounds, and firm mergers. Finally, the chapter concludes with the description of the effect that ambidexterity has on firm performance. Even though there are opposing views about the ambidexterity–performance relationship, the researchers agree that both exploration and exploitation

are needed for a supreme organizational performance, as organizations that use only exploration will find it difficult to gain the returns on their knowledge, while organizations that use only exploitation will normally suffer from obsolescence. It must also be emphasized that the measurement of ambidexterity is not an easy task. Ambidexterity instruments are constructed according to how scholars perceive ambidexterity, as balanced or combined, while performance measures in ambidexterity studies also differ, which are classified into objective and perceptual. Finally, ambidextrous organizations are classified based on how ambidextrous they are in relation to other firms. In that respect, the more inconsistent are their design elements, the greater their distance from a balanced ambidextrous structure, which in turn lowers the level of their performance and probability of their survival. The resulting framework of this chapter is graphically illustrated in Figure 2.7 that follows.

In the following chapter, a more specific description of ambidexterity is made based on Andriopoulos & Lewis's (2009) research, and ambidexterity is approached from two levels of analysis: organizational and industrial. In this way, it becomes clear how ambidexterity is managed across organizational levels, while recent research is also incorporated into the proposed framework. Miles & Snow’s (1978) organizational types are also used in this framework, which are linked with organizational ambidexterity.

Chapter 2
Organizational ambidexterity

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Figure 2.7: Summary graphic of chapter 2

CHAPTER 3

A MULTILEVEL APPROACH TO AMBIDEXTERITY

3.1 Introduction

In this chapter, for a better understanding of how ambidexterity is managed, the concept is approached from two levels of analysis: organizational and industrial. According to Birkinshaw & Gupta (2013), organizations are nearly decomposable systems, with parts that communicate with each other. So, effectively managed organizations must have some blend of exploration and exploitation at each level, and ambidexterity may occur at multiple levels of the organizations simultaneously. Therefore, in the present study, at the organizational level, a more holistic view is presented of how ambidexterity penetrates across multiple levels of management within a corporate setting. On the other hand, at the industrial level, it is investigated how top management teams of ambidextrous organizations use a specific set of strategic choices for exploration and exploitation in order to survive the intense competition of their industry.

3.2 Ambidexterity at the senior, middle, and employee levels

As ambidextrous organizations present exploration–exploitation tensions, managing them becomes a common responsibility, not only of top management, but also across organizational levels. According to Andriopoulos & Lewis (2009), the following three tensions appear to be highly important in an ambidextrous organization:

strategic intent at senior management level, customer orientation at middle management level, and personal drivers for employees. In addition, integration and differentiation tactics of these tensions are vital for successful ambidextrous management. Integration has to do with tensions that are tightly united, whereas differentiation focuses on each pole separately (see also Raisch & Tushman, 2016; Raisch & Zimmermann, 2017). A more comprehensive framework of ambidexterity tensions on different management levels is depicted in Figure 3.1 below.

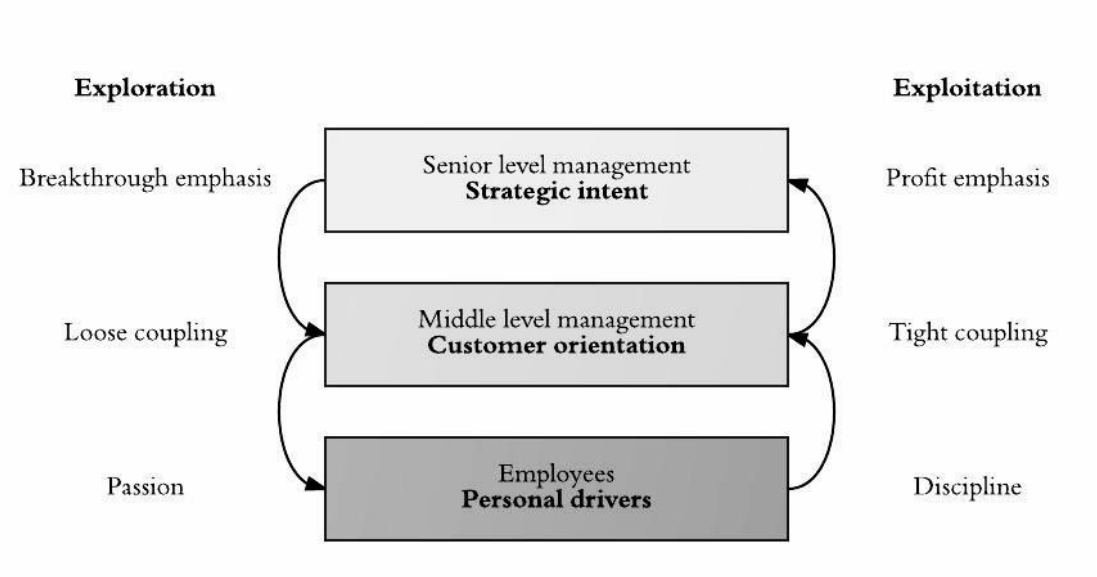

Figure 3.1: Virtuous cycles of ambidexterity (developed from Andriopoulos & Lewis, 2009, p. 707)

More specifically, Andriopoulos & Lewis (2009), in their study, examine ambidextrous organizations, which exploit existing products to enable incremental innovation and explore new opportunities to foster radical innovation. They study contextual ambidexterity in five ambidextrous firms in the product design industry, by using comparative case study research framework. They present nested paradoxes of innovation on the three levels of analysis as depicted in Figure 3.1: strategic intent (profit-breakthroughs), customer orientation (tight-loose coupling), and personal drivers (discipline-passion). The researchers build their framework of virtuous cycles

of ambidexterity based on innovation and paradox literature (see also Hargrave & Van de Ven, 2016; Sheep, Fairhurst, & Khazanchi, 2016) and discover that managing paradoxes is a shared responsibility at all the organizational levels.

Strategic intent in their study is presented as a firm's reason for having often encompassing contradictions. Top management teams view profit-breakthroughs tensions as paradoxical. Profit emphasis is linked to conservatism, as top managers stress upon the value of retaining key clients and efficiency, while breakthrough emphasis entails risk taking to enhance firm's reputation and adaptability. Accordingly, customer orientation surfaces during projects for project leaders to be tightly and loosely coupled to the client. Through tight coupling, project leaders stress upon the needs and constraints, whereas through loose coupling, they note possibilities and freedom. Finally, paradox of personal drivers entails discipline and passion, and employees describe them to be interdependent. Product development challenges demand discipline so that employees can obtain control, accountability, and structure in products, while through passion, they promote risk taking and creative expression.

The researchers propose that three factors may interact to reinforce and sustain organizational ambidexterity, which are a multilevel approach (strategic intent, customer orientation, and paradox of personal drivers), commentary tactics (integration and differentiation), and learning synergies (interplay between exploration and exploitation efforts), and in this way, firms might manage innovation paradoxes and thus fuel virtuous cycles of ambidexterity.

Accordingly, in the present study, a model that sheds new light on the organizational ambidexterity managed across multiple organizational levels is introduced (Turner et al., 2013). This model is built on Andriopoulos & Lewis's (2009) approach, which is presented above to explain how exploration–exploitation tensions are managed across the three levels of management (top management level, middle management level, and employee level), while recent research is also incorporated into this framework (Bledow, Frese, Anderson, Erez, & Farr, 2009; Chandrasekaran et al., 2012; Papachroni et al., 2016). It must be stressed, however, that even through Andriopoulos & Lewis (2009) identify three paradoxes of innovation at each level that constitute contradictory yet complementary poles (see also Bednarek, Paroutis, & Sillince, 2014, 2017; Sharma & Bansal, 2017), the current research deals with interrelated tensions of innovation and cost efficiency that appear in different degrees of emphasis at each of the levels (Sarkees & Hulland, 2009; Turner et al., 2013).

Three types of tensions appear at each of organizational levels: at the firm level, within projects, and at the employee level. By managing innovation, senior management teams define the context, provide vision, encourage creativity, and allocate resources appropriately in organizations (Angwin, Paroutis, & Mitson, 2009; O'Reilly & Tushman, 2011; Stadler, Rajwani, & Karaba, 2014). Middle management teams guide the projects through clear goal definition as well as experimentation (Mom, Fourne, & Jansen, 2015), while taking into account customer preferences (Paroutis, Heracleous, & Angwin, 2016). Finally, employees choose how and when to implement their creativity and discipline for the optimal result in product development (Andriopoulos & Lewis, 2009, 2010; Junni et al., 2015; McClean & Collins, 2011; Prieto-Pastor & Martin-Perez, 2015).

More specifically, at the senior management level, top executives seek to fulfill two interrelated goals: stable revenues to increase cost efficiency (exploitation) and innovative ideas to propel high performance (exploration) (March, 1991; Mihalache, Jansen, van den Bosch, & Volberda, 2014; Mom et al., 2009). On the one hand, efficiency is important for a wise allocation of resources in selected projects that will strengthen and promote organizational capabilities. On the other hand, top executives emphasize risk taking in search of opportunities through innovative projects that will enhance firm reputation, promote firm growth, and lead to supreme performance (Andriopoulos & Lewis, 2009; Angwin et al., 2009; O'Reilly & Tushman, 2011; Paroutis & Pettigrew, 2007).

At the middle management level, directors and project leaders seek to develop high quality customer relationships (Rogan & Mors, 2016), while focusing on clearly set goals (exploitation) and by using innovative ideas (exploration) (Burgess, Strauss, Currie, & Wood, 2015; Mom et al., 2015, 2007). Specifically, through strict deadlines, middle managers ensure that projects meet client expectations in a timely manner and comply with specific market needs. Through creativity and innovative ideas, project leaders are encouraged to investigate new areas even in projects with the most strict timelines and budget lines (Andriopoulos & Lewis, 2009; Chandrasekaran, 2009; Chandrasekaran et al., 2012; Danneels, 2003; Lassen, Waehrens, & Boer, 2009).

At the employee level, employees confront continuous challenges, which are discipline (exploitation) and creativity (exploration) (Hirst, van Knippenberg, Zhou, Zhu, & Tsai, 2015; Junni et al., 2015; McClean & Collins, 2011; Prieto-Pastor &

Martin-Perez, 2015). On the one hand, discipline includes responsibility and planning. Employees have explicit roles with certain targets and strict deadlines, where the repetition of exploitative activities increases the speed and the efficiency within projects. On the other hand, creativity gives employees the opportunity to be inspired and thus experiment with new and innovative ideas (Andriopoulos & Lewis, 2009; Chandrasekaran, 2009; Miron-Spektor, Ingram, Keller, Smith, & Lewis, 2017).

Finally, in accordance to Andriopoulos & Lewis (2009), Kang & Snell (2009) also refer that there are subcomponents in organizations in the form of organizational capital (OC, structures and processes within the firm), social capital (SC, knowledge embedded within the network of relationships), and human capital (HC, skills embodied within individuals), and the above subcomponents can be manifested with both exploitative and exploratory elements. In the Table 3.1 that follows, a more systematic review of some of the key studies is addressed that refer to ambidexterity management at multiple organizational levels.

Table 3.1: Key studies that present how ambidexterity is managed at multiple organizational levels

Levels of analysis	Author(s)	Year	Type of ambidexterity	Key findings
Organization	O'Reilly & Tushman	2004	Structural ambidexterity	• Firms can implement an ambidextrous approach by using separate business units to perform either standard operations or radical innovations.
	• Gibson & Birkinshaw • Cao et al.	2004 2009	Contextual ambidexterity	• Business units can obtain the capacity to simultaneously demonstrate alignment (exploitation) and adaptability (exploration). Their proper context facilitates this contextual ambidexterity, which in turn leads to organizational success.
	• Bower & Christensen • Benner & Tushman • Simsek et al.	1995 2003 2009	Partitional ambidexterity	• One organizational unit focuses on exploration and the other on exploitation, while the integration must take place at the senior team level.
	Zimmermann et al.	2015	Contextual ambidexterity	• The study shows how top-down charter definition process can be complemented with an alternative emergent (or bottom-up) charter definition process,

				in which frontline managers take the initiative to adopt an ambidextrous orientation in their part of the organization.
Group/project	Gupta et al.	2006	• Contextual ambidexterity • Structural ambidexterity	• Exploratory (R&D) groups can work effectively with exploitative, sales, and manufacturing groups. However, R&D units should also incorporate standard, exploitative functions, as well as sales and manufacturing groups should try explorative, novel techniques. • The researchers also debate whether exploration and exploitation represent a continuum or whether they are orthogonal (coexisting, not competing).
	He & Wong	2004 2009	• Contextual ambidexterity • Structural ambidexterity	• Both exploration–exploitation may be performed together without requiring a trade-off. At the level of a group, they may be put on a continuum, where at one end structural ambidexterity may be situated (separate exploratory and exploitative units) and at the other end contextual ambidexterity may be placed (homogenous units).
	Liu & Leitner	2012	• Contextual ambidexterity	• Both radical innovation and incremental improvements in projects. This study, through in-

			• Structural ambidexterity • Temporal ambidexterity	depth case study of engineering projects, investigates the effects of ambidexterity on project performance. The researchers found that: (1) ambidexterity at the project level contributes significantly to project performance, (2) the degree of team ambidexterity has a comparable impact on project performance in case of temporal separation in projects, and (3) structural separation has not contributed to project team ambidexterity in this study.
	• Pellegrinelli et al. • Turner et al.	2015 2015	Contextual ambidexterity	• Both exploitation of knowledge & exploration of innovative ideas in projects and programs. The researchers use a longitudinal case research to study how ambidexterity is achieved through the use of projects in programs. They found that a strategic, emergent approach created flexibility in programs, while the projects were managed to guarantee the consistent, reliable, and efficient delivery of products, changes, and key capabilities in order to support these programs.
Individual	Farjoun	2010	Contextual ambidexterity	• Individuals engaged in routine tasks exercise some

				form of experimentation, whereas those engaged in creative tasks also use routines to some extent.
	Bonesso et al.	2014	Contextual/personal ambidexterity	• Personal ambidexterity is analyzed along two dimensions: (1) individual perceptions and (2) individual behaviors. When comparing the two dimensions, the researchers provide the classification of personal ambidexterity. They stress the point that prior work experience and behavioral competences of an individual impact personal ambidexterity. They conclude their study by referring that individuals may change their types of personal ambidexterity to reduce the cognitive dissonance.
	Rogan & Mors	2014	Contextual ambidexterity	• The researchers propose that managers' networks are an important factor to balance the trade-off between exploration of new business and exploitation of existing business. Their analysis revealed that there exist significant differences in the density, contact heterogeneity, and informality of ties in the networks of senior managers who were engaged in both exploration and exploitation

				in comparison to managers that either explored or exploited. They conclude by stressing the fact that managers' networks play a major role in promoting ambidexterity.
	Stokes et al.	2015	Contextual ambidexterity	• In this article, the researchers analyze the literature on ambidexterity including the definition of the nature, characteristics, and normative boundaries of ambidexterity. They study interfirm/unit comparisons of large-scale corporations and analyze senior teams' disposition and action-orientations. • Overall, they examine both micro-level and macro-level aspects of ambidexterity, as they approach the study of ambidexterity from the intra-organizational, individual and micro-behavioral levels.

More specifically, the above table is divided into three parts. In the first part, key studies of how ambidexterity is managed on the organizational level are presented. In the second part, seminal studies about how ambidexterity is managed on the group and project levels are developed. And finally, in the third part, key studies about how ambidexterity is managed on the individual level are discussed.

The analysis of some current studies follows in order to explain the latest findings in the field of ambidexterity management across multiple levels. For example, one recent study, where contextual ambidexterity is managed on the organizational level is that of Zimmermann et al. (2015). This study deals with how organizations decide to adopt an ambidextrous orientation. More specifically, researchers show how top-down and bottom-up processes can be complemented, in which front line managers interact with senior executives to cause the adoption of an ambidextrous orientation in their part of the organization. They base their argument on the notion that change in organizations does not just happen through a top-down process, as frontline managers frequently take the initiative to pursue and sell new ideas to their superiors. Bottom-up knowledge inflows provide higher-level managers with an increased understanding of changes regarding technologies, products, and markets, which can push them to revise strategic decisions.

Another recent study that deals with ambidexterity management on the firm and unit levels and forms the basis for a multilevel understanding of ambidexterity is that of Raisch & Tushman (2016). In their study, the researchers use six longitudinal cases of large firms' new business initiatives, where they discover that corporate businesses undergo a graduation process in which they have to meet different

expectations of multiple organizational resource providers. At the unit level, these businesses have to convince established, core units that the potential value of cooperation between the units (new and old) is higher than the cost of cannibalization and internal competition. Whereas, at the corporate level, the new units have to convince that they add value to the whole organization by adding strategic capabilities that compliment those of the main organizations. The scholars contribute to the literature by showing how companies create exploratory businesses and manage to reach scale, while overcoming the complex relationship between the corporate ventures and their parent organizations.

More specifically, the researchers highlight the fact that ambidexterity scholars investigate in different ways how mature firms manage to handle exploration–exploitation tensions. Established firms, due to their size and structure, resort to the creation of exploratory business units, alongside with their exploitative core businesses. In their effort to study such dual structures, scholars use either a static or, more recently, a dynamic perspective. In the static perspective, firms simultaneously explore and exploit differentiation and integration elements. Structural differentiation ensures that each subunit is configured according to its specific task requirements, whereas integration enables resource allocation, strategic coherence, and the integration of knowledge sources across differentiated units. Dynamic perspective is comprised of contingency perspective, vacillation perspective, and life-cycle perspective. In all of these perspectives, scholars stress that organizations transition between phases of exploration and exploitation, while taking into account environmental dynamism shifts, structural shifts, and organizational evolvement.

Moreover, the researchers emphasize the fact that exploratory initiatives are risky and uncertain, and in such situations, in order to limit the risk of the initiative, firms start with small initial investments. This gives them the opportunity to be flexible enough to either postpone or continue with the initiative to a larger scale. In this phase, when adequate information becomes available to reduce uncertainty, firms have the option to continue with the exploitation of the opportunity, as long as they can earn a premium for bearing the uncertainty, in addition to covering the costs of the development of the initiative. Otherwise, firms decide to abandon or downscale this initiative. In their study, the researchers use the static and the dynamic perspectives with three phases (exploratory, transition and exploitative) and uncover horizontal and vertical relations during the exploratory phase and find out how these relations are interrelated. They also point out how crucial the transition phase is.

Finally, a key point in their study has to do with the management of exploration–exploitation tensions through a multilevel leadership. Generally, ambidextrous studies focus mostly on the senior management level (Zimmermann et al., 2015), while, in their work, the researchers show that middle managers' role is also important, as they undertake complex leadership tasks during the transition phase. Initially, they distance the units from their peers through the shaping of inter-unit relationships, and then they promote the exchange of information between them. Therefore, while senior managers make the final decision to postpone or abandon the initiative, middle managers also influence this decision.

In the study of Cao et al. (2009), researchers also approach the conceptualization of organizational ambidexterity on the firm level. In their study, they refer to two

dimensions of ambidexterity, which they call the balance dimension of ambidexterity (BD) and the combined dimension of ambidexterity (CD). In BD, they discuss the maintenance of relative balance between exploratory and exploitative activities on the firm level, whereas in CD, they refer to their combined magnitude. They also emphasize that high levels of BD and CD produce synergistic benefits, and they stress upon the fact that BD is beneficial to resource-constrained firms, while CD is more beneficial in firms with greater access to internal and external resources. They conclude that in firms with constrained resources, a focus on either exploration or exploitation is more desirable, whereas in firms with sufficient resources, the pursuit of exploration and exploitation is both possible and desirable.

Pellegrinelli et al. (2015), in their research on the project level, studied both exploitation of knowledge and exploration of innovative ideas in projects and programs. The researchers used a longitudinal case research to study how ambidexterity is achieved through the use of projects in programs. They found that a strategic, emergent approach created flexibility in programs, while the projects were managed to guarantee a consistent, reliable, and efficient delivery of products, changes, and key capabilities in order to support these programs. Their study contributes to the literature of ambidexterity by studying how ambidexterity works in practice and how projects and programs are used for implementing strategic change.

Finally, Stokes et al. (2015), in their study about individual ambidexterity, analyze the literature on ambidexterity, including the definition of the nature, characteristics, and normative boundaries of ambidexterity. In addition, they study inter-firm/unit comparisons of large-scale corporations and analyze senior teams' disposition and

action-orientations. Overall, they examine both micro-level and macro-level aspects of ambidexterity, as they approach the study of ambidexterity from the intra-organizational, individual, and micro-behavioral levels. They conclude their work by pointing out the significance of the role of sense-making in the individual and small-group situations, and they stress upon the importance of their contribution to the macro-organizational ambidextrous contexts.

3.3 Ambidexterity at the horizontal, vertical, and organizational levels

Ambidexterity has to be managed not only at each level, but also across levels. For instance, even though decisions about exploration and exploitation can take place at the senior management level (Angwin et al., 2009; Halevi et al., 2015; Paroutis & Pettigrew, 2007), they still have to be implemented as projects by project leaders and employees (Chandrasekaran et al., 2012). Exploration–exploitation activities, therefore, can penetrate within organizations at the same level (horizontal ambidexterity), across levels (vertical ambidexterity), and through the entire organization (organizational ambidexterity).

More specifically, in the context of horizontal ambidexterity penetration, it is important to explore how effectively individuals at each level can balance tensions in making exploitation-exploration decisions. For instance, senior management faces difficulties in assessing how to best allocate financial resources in order to increase firm performance, while simultaneously taking into account environmental dynamism, organizational structure, and strategic orientation of the organization (Andriopoulos & Lewis, 2009; Chandrasekaran et al., 2012; Raisch & Hotz, 2010).

When comparing organizational levels, Papachroni et al. (2016) argue that senior management levels face tensions of innovation and efficiency, while lower organizational levels deal with the operational tensions of these dual demands. They also stress upon the fact that individuals perceive the innovation-efficiency relationship differently, a fact that creates different sub-tensions at the lower levels (see also Chang, 2015; Sheep, Fairhurst, & Khazanchi, 2016). For example, at the senior management level, innovation is related to strategic innovation (Gedajlovic, Cao, & Zhang, 2012; Halevi et al., 2015), while at the middle management level, innovation is perceived as a process innovation in order to achieve higher efficiency (Burgess et al., 2015; Papachroni et al., 2016). In other words, while senior executives are constantly searching for the appropriate strategic customers that will add value to their organizations (Angwin et al., 2009; Doh, Lawton, Rajwani, & Paroutis, 2014), middle managers are working more closely with these customers in order to satisfy their needs with innovative products, whereas employees, in close cooperation with middle management, are trying to improve the above products, based on their creative ideas and their perception of innovation.

In addition, according to Farjoun (2010), the exploration–exploitation relationship can be considered as duality of stability and change. This duality in different units and hierarchical levels may intertwine and reinforce each other. With regards to individuals, those that are engaged in routine tasks exercise some form of experimentation and creativity, while those engaged in creative tasks use routine to some extent. However, even though research that sheds some light on similarities between organizational levels within a single organizational context is scarce (Chandrasekaran et al., 2012; Papachroni et al., 2016), exploration–exploitation

tensions seem to have common characteristics between the levels. It is possible to compare those in terms of their ambidexterity, while the exploration–exploitation activities that take place at the higher level appear to occur in different degrees of detail at the lower levels (Sheep et al., 2016).

In the vertical ambidexterity penetration, senior executives can promote ambidexterity in two ways: by communicating explorative and exploitative activities directly through interpersonal interactions with the middle management teams (Zimmermann et al., 2015) and by communicating exploration and exploitation indirectly with employees who have direct communication with the middle management (Elenkov, Judge, & Wright, 2005; Jansen, Vera, & Crossan, 2009; Shrivastava & Nachman, 1989). This can be achieved through formal, as well as informal communication (Paroutis et al., 2016), face-to-face meetings, explicit task objectives, and regular discussions (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016; Mom et al., 2007; Paroutis & Heracleous, 2013). Some organizations also use scorecards and disciplined project management (Chandrasekaran et al., 2012; Turner & Lee-Kelley, 2013), incentive schemes (Faisal Ahammad et al., 2015; Papachroni et al., 2015; Patel, Messersmith, & Lepak, 2013), and different strategic alignment models (Paroutis et al., 2016) to promote vertical ambidexterity. In this way, decisions are connected across levels in order to ensure that the organization has the ability to adhere to its goals and adapt to changes (Chandrasekaran, 2009; Paroutis & Heracleous, 2013; Raisch & Tushman, 2016). Therefore, strategic-level decisions are aligned with project level activities (Paroutis et al., 2016), and the higher the level of alignment, the higher the effectiveness of organizations to operate ambidextrously (Chandrasekaran et al., 2012; De Clercq,

Thongpapanl, & Dimov, 2013; Heyden et al., 2015; Junni et al., 2013; Zimmermann et al., 2015).

In the organizational ambidexterity penetration, what is important is the effectiveness of organizations to operate ambidextrously (Gedajlovic et al., 2012; Gibson & Birkinshaw, 2004), a fact that is reflected in their performance, while also taking into account organizational structure, strategy, and environmental dynamism (Carmeli & Halevi, 2009; Fiss, 2011; Good & Michel, 2013; Raisch et al., 2009; Raisch & Hotz, 2010). For example, Raisch & Hotz (2010) have argued that in standardized, centralized, and hierarchical organizations, exploitation is preferred over exploration. In general, if there is no incentive system in place that rewards creative behavior (Bledow et al., 2009; Turner et al., 2013), exploitation is preferred over exploration even in the most entrepreneurial organizations, as exploitative projects have fast and predictable results, whereas explorative projects are risky (Raisch & Tushman, 2016) and the expected returns take longer to materialize (Brion, Mothe, & Sabatier, 2010; Chandrasekaran et al., 2012; Raisch & Hotz, 2010; Sethi & Sethi, 2009). Finally, in stable environments, an exploitative orientation of organizations or a balanced approach to ambidexterity leads to higher performance (Junni et al., 2013), whereas in dynamic environments, an exploration-oriented behavior is more effective rather than an exploitative one (Davis et al., 2009; Gedajlovic et al., 2012; Lavie, Stettner, & Tushman, 2010; Raisch & Hotz, 2010).

In Figure 3.2 below, the above framework is briefly outlined. More specifically, it shows how the exploration–exploitation tensions unfold on each level and how ambidexterity penetrates across the levels.

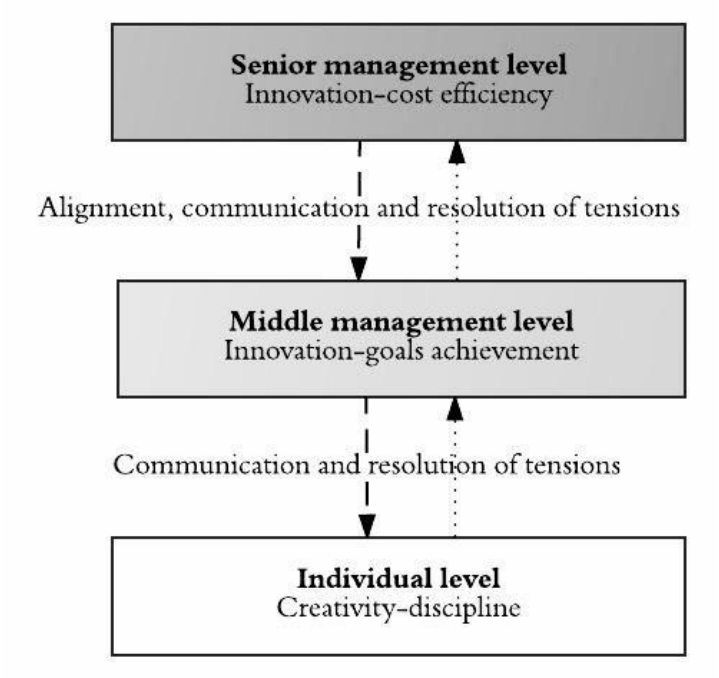

Figure 3.2: Framework of ambidexterity penetration

In sum, this figure demonstrates how exploration–exploitation tensions are managed on the three organizational levels (senior, middle and employee), something that is called horizontal ambidexterity penetration. More specifically, senior managers handle innovation and cost efficiency simultaneously on their level of analysis, while middle managers handle innovation and goals achievement on the middle level, whereas employees manage their creativity and discipline in projects. Ambidexterity also penetrates vertically across all the three levels through organizational alignment, communication, and resolution of tensions of explorative-exploitative activities between individuals. Finally, ambidexterity can also penetrate throughout the whole organization, while taking into consideration organizational structure, strategy, and environmental dynamism.

Finally, in accordance to the above assertion, this study also extends Boumgarden et al. (2012) and Birkinshaw & Gupta's (2013) work, while linking ambidexterity with firm performance. In that respect, it is proposed by the researchers that there are different degrees of ambidexterity penetration in organizations, and thus firms can be classified into categories according to which they may achieve high ambidexterity penetration, if they achieve the proper balance of exploration–exploitation across all organizational levels. Otherwise, in the case that they miss some or all the elements needed for a more ambidextrous structure, they are considered to present lower ambidexterity penetration. In that regard, Table 3.2 sets the criteria for a high and low ambidexterity penetration in organizations.

Table 3.2: Classification of ambidexterity penetration in organizations

Ambidexterity penetration	
High	• Horizontal ambidexterity penetration refers to the way ambidexterity penetrates at each level: o Senior management level: simultaneous focus on innovation (exploration) and cost efficiency (exploitation) by senior executives o Middle management level: simultaneous focus on innovation (exploration) and goals achievement (exploitation) by project leaders o Employees level: simultaneous focus on creativity (exploration) and discipline (exploitation) by employees • Vertical ambidexterity penetration refers to the way ambidexterity penetrates across levels o Between the senior executives' level and that of middle managers: by using techniques such as alignment of decisions, frequent communication and resolution of tensions o Between the middle managers' level and that of employees: by using techniques such as frequent communication (ad hoc and e-mail) and resolution of tensions • Organizational ambidexterity penetration: refers to the way ambidexterity penetrates through the whole organization o Organizational structure: medium organizational structure, as too much structure restrains individual action and favors exploitative activities o Environmental dynamism: medium dynamism environments, as too dynamic environments need less structured organizations, and thus, more flexible individuals who focus on explorative activities
Low	• Missing some or all of the elements referred above.

3.4 Linking organizational forms and approaches with ambidexterity

Finally, by acknowledging the interdependence between organizational structures, strategies, their external environments, and ambidexterity (Carmeli & Halevi, 2009; Fiss, 2011; Raisch et al., 2009; Raisch & Hotz, 2010), a theoretical framework is introduced below that offers insights into how senior managers define, design, and implement appropriate modes for pursuing exploration and exploitation. Therefore, the research of three ideal approaches is extended based on Miles & Snow's (1978) "adaptive cycle" that describes how organizations define and embody distinct strategies and pursue them in particular structural configurations. Namely, prospectors, defenders, and analyzers are specific organizational types that adopt certain approaches to balancing exploration and exploitation that function as tools to effectively bridge the gap between organizations' present fitness level and environmental demands. A fourth type, the reactor, is a residual type, which in contrast to other three, lacks a consistent strategy-structure relationship and thus presents an absence of strategy rather than a viable strategy (Fiss, 2011; Mahr, 2010).

To illustrate how senior managers may be working in an organizational environment with a certain strategic orientation, at the left end of the organizational structure continuum, high-tech organizations are placed that are conservative, risk-averse, and stable, which strive for improved firm performance through organizational cost efficiency (exploitation). At the right end of the organizational structure continuum, entrepreneurial, high-tech firms are placed that invest in radical innovations in order to compete aggressively with other firms (exploration). In that respect, defenders and prospectors reside at opposite ends of a continuum of adjustment strategies. However, it is possible that the optimal fitness level may require simultaneous

activities of exploration and exploitation. For this reason, between the two extremes lies a third type of organization, the analyzer, which represents a viable alternative to these two strategies (Blarr, 2012; Fiss, 2011; Miles & Snow, 1978). The above three approaches are depicted in Figure 3.3 below. In the following sections, I examine the unique characteristics of each of the abovementioned types.

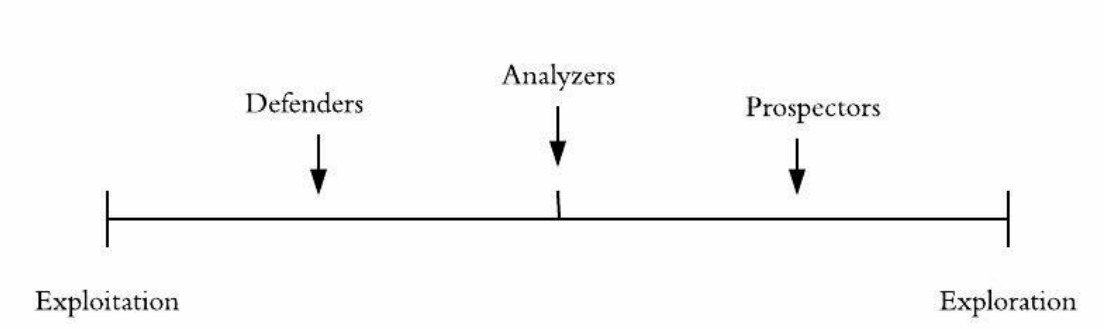

Figure 3.3: Organizational structure continuum (developed from Auh & Menguc, 2005, p. 1655)

3.4.1 Defenders and ambidexterity

Defenders (i.e. their top management teams), through highly centralized actions and managerial decision-making, achieve a stable and predictable organizational environment. They generate only a limited set of products, aimed at a certain segment of the total market. These organizations place emphasis on exploitation of the past knowledge, cost minimization, competitive pricing, and high-quality products, while ignoring developments and trends outside their domains. They purposefully choose to specialize in exploitation in order to achieve strict control of the organization to ensure cost efficiency. For this reason, production and control specialists, that tend to communicate through formal hierarchical channels, heavily dominate their top management groups (Fiss, 2011; Miles & Snow, 1978).

Defenders show conservative strategic views, rigidity in behavior, and limited capacity to adapt the senior management level. For these organizations, adaption demands flattening of the organizational structure and relaxation of structural rigidity in support of more explorative activities. Again, the degree of adaption capacity varies by the type of balancing method employed. Creativity, attention to detail, and quality could contribute to innovative ideas and thus supreme performance (Miles & Snow, 1978).

Different organizational ambidexterity types could promote ambidexterity in such organizations: structural separation of separate exploitation and exploration units with emphasis on exploitation; temporal separation with more time devoted on exploitation, followed by some time devoted on exploration; mode separation with a focus on exploitation internally and on exploration via alliances or acquisitions; and finally contextual separation with more emphasis placed on exploitation than on exploration within the same unit. All the above forms of ambidexterity, however, demand flexibility in organizational routines and procedures and learning capacity at the top management level.

The defender strategy can be viable in most stable industries rather than turbulent industries. For instance, a multinational, high-tech company is more suitable for a defender strategy, rather than an entrepreneurial company (Miles & Snow, 1978).

3.4.2 Prospectors and ambidexterity

Prospectors act in highly dynamic environments, and their primary aim is to find and explore new market and product opportunities. Their main concern is to be

innovative rather than profitable. For this reason, their domain is usually broad, and they are in a continuous state of development. Prospectors constantly develop and maintain a wide range of environmental conditions, trends, and events through highly creative individuals and teams, and that is why they frequently become the creators of change in their respective industry. However, flexibility and creativity demand the creation of multiple, novel technologies with a low degree of routinization and mechanization. This means that prospectors' administrative system must be able to deploy and coordinate resources among numerous, decentralized units and projects, rather than have a highly hierarchical, central structure (Fiss, 2011; Miles & Snow, 1978).

Prospectors use in their top management groups mainly marketing and R&D experts in order to accomplish overall facilitation and coordination of units and projects. As they heavily invest in new and innovative projects, they run the primary risk of low profitability and overextension of resources. While they are flexible and rapidly respond to changing environment, complete efficiency cannot be obtained because of the presence of multiple technologies. Nonetheless, prospectors' top management embraces uncertainty and seeks to compete via innovation, and thus they keep organizational routines and processes simple to allow emergent adaption (Miles & Snow, 1978).

Different organizational ambidexterity types could exist in such organizations where prospectors have a greater capacity to adopt any of the four balancing approaches. Regarding contextual ambidexterity, senior management has broader strategic view and flexibility to simultaneously engage organizational members in exploration and

exploitation in a single unit. They can also implement temporal separation by working on the existing projects first and then exploring new opportunities in innovative projects. Similarly, structural separation is also viable where senior management team facilitates existing projects in some of the units and works on new, innovative projects in different units. Finally, in mode separation, the in-house production units can be used to produce the new/innovative products that still require improvements/modifications, while the production of the legacy products can be outsourced to external production units through alliances.

The prospector strategy can be viable in most dynamic industries rather than stable industries. For instance, entrepreneurial, high-tech companies are more suitable for a prospector type, as they follow a first-mover strategy that involves the fast learning and assimilation of new patterns and associations at the organizational level. They are associated with entrepreneurship, innovation, flexibility, and pro-activeness.

3.4.3 Analyzers and ambidexterity

Between the two extremes of defenders and prospectors lies a third type of organization that is called the Analyzer (Fiss, 2011). Its top management is comprised of ambidextrous individuals whose main goal for their organization is to minimize the risk, while maximizing the opportunity for profit. This strategy is difficult to pursue, especially in highly dynamic industries and technologically intense markets. For this reason, analyzers' adaptive approach must strive to achieve balance between explorative and exploitative activities (Miles & Snow, 1978). Nonetheless, analyzers' strategy is much more effective than those of defenders and prospectors in relation to return on investment and market share (Hambrick, 1983),

while in general, analyzers present higher profitability and superior performance, as they simultaneously achieve efficiency and adaptability (Fiss, 2011).

Analyzers move toward new products or new markets through imitation and thus pursue a second-mover strategy, while the majority of their revenues comes from fairly stable set of products and customer or client groups. They must learn how to achieve equilibrium between conflicting demands for technological flexibility and technological stability. This can be achieved by quickly imitating innovation developed by a competitor, without incurring extensive R&D expenses (Miles & Snow, 1978).

Analyzers use a specific set of strategic choices for exploration and exploitation in order to survive within the intense competition of their industry. Their top management teams are characterized by an entrepreneurial management style, and their companies present an organizational form of a centralized, hierarchical structure. Their managers' intent is to achieve and maintain a balance between conflicting demands for technological flexibility and operational efficiency. These organizations exhibit mixed characteristics of entrepreneurship and control, as their top management teams make pro-active efforts to ensure that search for exploration and exploitation of new knowledge is within the organizations' scope and control.

Different organizational ambidexterity types may exist in such organizations, where analyzers have a greater capacity to adopt any of the four balancing approaches, provided that they achieve a balance between the stable and dynamic areas of operation. Due to a dual technological core, however, analyzers face the problem of

operating fundamentally different planning, control, and reward systems simultaneously (Miles & Snow, 1978). At the same time, goal conflicts and the sequential allocation of attention between exploration and exploitation at the individual level make contextual (simultaneous) ambidexterity a challenging task for analyzers. The same thing applies to temporal separation, which requires senior managers to proceed with current projects, while exploring new product solutions. Again, temporal separation becomes ineffective due to the time required to transition and dislodge internal inertia pressure.

In contrast, organizational separation is most suitable for analyzers as their senior management team can realize, control, direct, and organize exploration–exploitation efforts within and across organizational units. Accordingly, mode separation primarily operates at the senior management level. In relatively stable environments, analyzers may seek to explore internally and exploit through alliances and acquisitions to lower the expenses incurred and thus engage in R&D. In more turbulent environments, rapid markets, and technological changes, analyzers may seek to exploit internally and explore though alliances and acquisitions to gain immediate and cost-effective access to new knowledge and technologies. To that end, analyzers have the necessary adaption capacity at the senior management level to effectively implement both organizational separation and mode separation. Table 3.3 below presents Miles & Snow's (1978) organizational types as developed by Blarr (2012) and links them with ambidexterity.

Table 3.3: Miles & Snow's (1978) organizational types (developed from Blarr, 2012, p.23)

	Defender	**Prospector**	**Analyzer**
Entrepreneurial	Focus on efficiency	Focus on innovation	Balance of efficiency and innovation
Engineering problem	Core technology	Core innovation	Core technology and innovation
Administrative problem	Functional, centralized	Divisional, decentralized	Matrix
Major risk	Slow adaption to changes	Lack of profitability	Neither efficient not innovative

The above table is based on the work of Blarr (2012), according to whom the focus of strategic management research centers on the fit between organizational structure and strategy. More specifically, when reviewing contemporary literature, scholars in the field of strategic management accept mostly the approach of Miles & Snow, (1978) about the ideal fit between strategy and structure. The three types that were previously analyzed in detail (defender, prospector, analyzer) are in fact the ideal matches between different strategies and appropriate structures that Miles & Snow (1978) named "the adaptive cycle".

What has not been discussed, however, is that this adaptive cycle comprises three fields of problems that are linked to ambidextrous behaviors of top managers, so that they could adapt their organizations to the influencing external factors. The first field deals with the entrepreneurial problem, which focuses on the proper allocation of

resources by top managers between products and markets. The second is the engineering problem, where top managers should decide on the appropriate business model between production processes (exploitative) and specific innovative technologies (explorative). And finally, the third field relates to the administrative problem, where top managers should achieve the proper balance between structure and processes, while adopting centralized or decentralized structural approach.

Each strategic type (defender, prospector, and analyzer) has its own strategy of adaption to entrepreneurial, engineering, and administrative problems, as presented in the Table 3.3 above.

3.5 Summary

In summary, in this chapter, ambidexterity management is presented at the top management, middle management, and employee levels. Ambidexterity penetration is described across horizontal, vertical, and organizational levels, and finally organizational forms and approaches are linked with ambidexterity based on the Miles & Snow's (1978) adaptive cycle. More specifically, this study is based on the Andriopoulos & Lewis's (2009) virtuous cycles of ambidexterity that are developed on the three organizational levels and are called strategic intent, customer orientation, and personal drivers. Strategic intent deals with exploration–exploitation tensions at the senior management level, customer drivers are tensions occurring at the middle management level, and personal drivers are tensions emerging at the employee level. The researchers use innovation and paradox literature in their study, and their framework is incorporated in the current study of the examination of the contextual ambidexterity, where interrelated tensions of innovation and cost efficiency appear in different degrees of detail at each of the three levels previously

mentioned. In the same section, recent key studies are also presented, forming the field of interest of many researchers on how ambidexterity is managed at multiple levels in the ambidextrous organizations.

The chapter continues by analyzing the way that ambidexterity penetrates across multiple organizational levels. This is a novel concept in the field of organizational ambidexterity, where ambidexterity can (a) penetrate (or be managed) at the horizontal level, (b) penetrate across management levels from the senior teams down to the employee level, and (c) penetrate within the whole organization based on environmental and structural constraints of ambidextrous organizations. Alignment, proper communication, and resolution of tensions are also important attributes for a successful ambidexterity penetration in organizations. In that respect, in the current study, organizations are classified according to a high and low degree of ambidexterity penetration in their organizational settings.

Finally, in this study, different organizational forms and approaches, which are related to ambidexterity, are presented. Miles & Snow's (1978) framework is used to describe different organizational types (defenders, analyzers and prospectors), and these approaches are associated with ambidexterity. In that respect, the focus of this study centers on the relation between organizational structure and strategy. More specifically, the three organizational types comprise three fields of problems that are linked to ambidextrous behaviors of top managers, so that they could adapt their organizations to the external factors of their environment. These three problems are entrepreneurial (scarce resources between products and markets), engineering (business model between production process and innovative technologies), and

administrative (balance between centralized and decentralized structural approach). The organizations under investigation in the present study are found to be defenders and prospectors. The resulting framework of the whole chapter is graphically illustrated in Figure 3.4.

In the following chapter, the research focuses on the top management level and, more specifically, on the ambidextrous leadership. Recently, some scholars have shed some light on the ambidextrous leadership theory, while they also stress upon the importance for this leadership concept to be studied in more detail. In that respect, in this study, the ambidextrous leadership concept is studied in the stream of strategic management and is approached from the angles of contingency theory, transformational and transactional leadership styles, and environmental and structural constrains that play a major role for a deeper understanding of the theory of ambidextrous leadership. Therefore, it is within the scope of this research to make an important contribution to the field of leadership research and show how senior managers successfully handle exploration and exploitation tensions in their organizations.

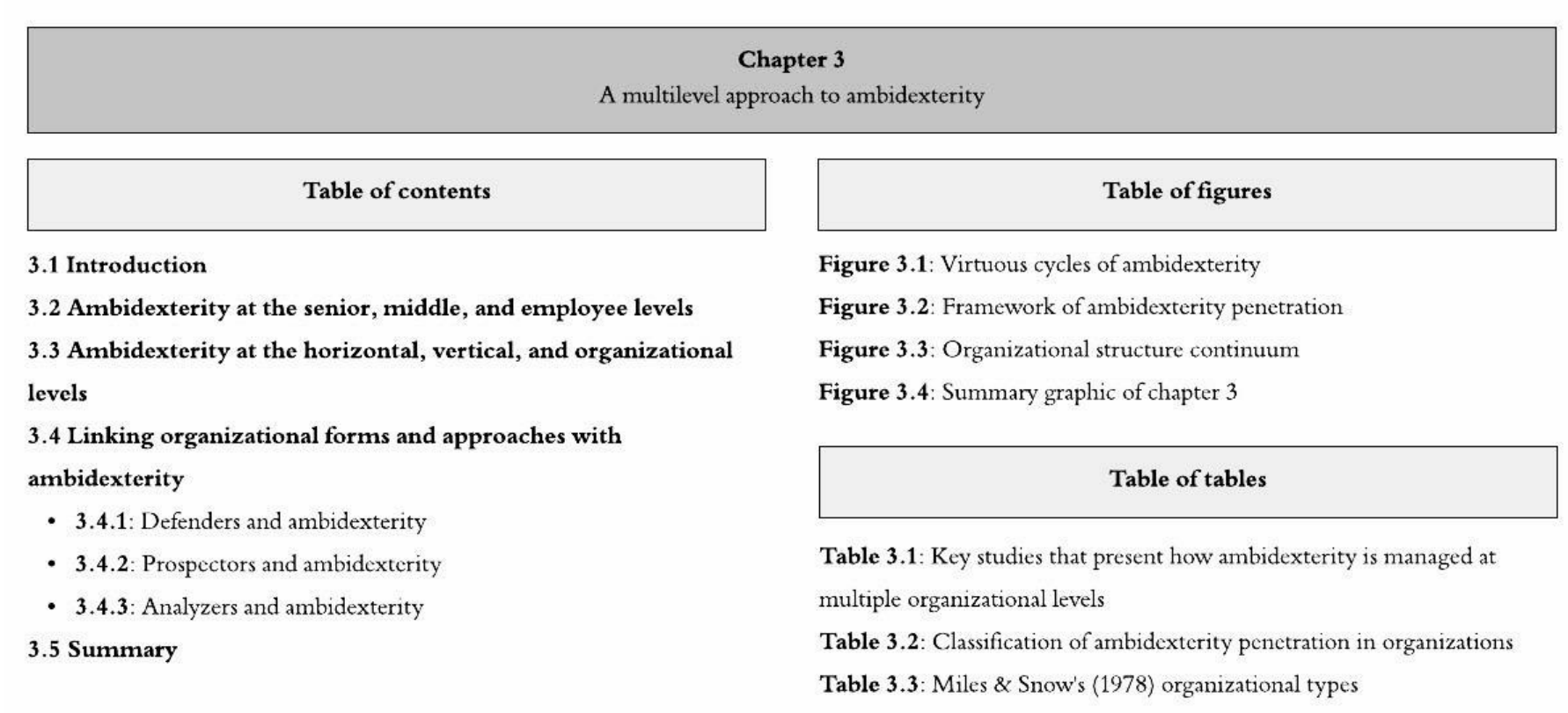

Figure 3.4: Summary graphic of chapter 3

CHAPTER 4

AMBIDEXTROUS LEADERSHIP

4.1 Introduction

This chapter presents the ambidextrous leadership concept, where the attention is mainly focused on the top management level. Research has shown that ambidexterity and organizational performance are functions of both individual and organizational influences. Therefore, in this chapter, ambidextrous leadership at the top management level is presented, which is considered to be the nucleus of an organization, where leaders have the abilities to pursue explorative and exploitative activities simultaneously. Organizational and environmental constraints are also taken into account, which restrict and influence leadership actions. The particular study of leadership behaviors and the presence of ambidexterity tensions in their strategic decisions have been considered necessary, as leadership has the highest impact on the overall ambidexterity of the organization, a fact that will be thoroughly analyzed in this chapter.

4.2 The ambidextrous leadership concept

4.2.1 The strategic leadership concept

The literature on ambidexterity has increased exponentially, especially in recent years. Despite the plethora of research output on ambidexterity, however, there are still gaps in our understanding about the role of leaders (including chief executive

officers, boards of directors, and top management teams) (Angwin et al., 2009; Paroutis et al., 2016; Rogan & Mors, 2014; Simsek, Jansen, Minichilli, & Escriba-Esteve, 2015) in ambidextrous organizations (Good & Michel, 2013; Halevi et al., 2015; Jansen et al., 2008; Knight & Paroutis, 2017b). It must be stressed upon that leadership theory refers to leaders at any level in the organizations (Avolio, Walumbwa, & Weber, 2009), whereas strategic leadership extends the original upper echelons theory and deals with the study of people at the top of the organizations (Carter & Greer, 2013; Hambrick & Pettigrew, 2001; Vera & Crossan, 2004; Yukl, 2013). In this research, leadership is correlated with strategic leadership, and the attention is paid on the top management teams.

Leadership is a multi-level concept (Collinson, 2005; Gooty, Serban, Thomas, Gavin, & Yammarino, 2012; Morrell & Hartley, 2006a, 2006b; Raisch & Tushman, 2016). Even though different levels of analysis (or holistic and interdisciplinary approaches) must be used to explain leadership (Birkinshaw & Gupta, 2013; Morrell, 2010; Raisch & Birkinshaw, 2008), still the leadership discussion mainly concentrates on the specialized analysis of leadership in empirical studies. Regarding individual-level ambidexterity, Rogan & Mors (2014), in their research, have also emphasized on the fact that the scarcity of individual level studies on ambidexterity may be the function of two key challenges: one empirical and one theoretical. First, even though researchers recognize the importance of individual behaviors for the promotion of ambidexterity, it is difficult to observe empirically the processes that drive firm-level capabilities for ambidexterity on the individual level. Second, studies of ambidextrous behaviors of leaders have been limited to cognitive processes needed to balance exploration and exploitation.

With respect to ambidextrous leadership, only few studies provide insights into what specific behaviors (Rogan & Mors, 2014; Tuncdogan, Van Den Bosch, & Volberda, 2015) and leadership styles accomplish ambidexterity (micro-level) (Good & Michel, 2013; Havermans et al., 2015; Luo et al., 2016; Mihalache et al., 2014; Yukl, 2009) and how organizational constraints influence ambidextrous leadership (macro-level) (Halevi et al., 2015). Therefore, it is within the scope of this research to link the micro-level behaviors of ambidextrous leaders with their macro-level activities (Aguinis, Boyd, Pierce, & Short, 2011; Stokes et al., 2015).

Leadership seems to play a key role in facilitating ambidexterity and thus enhancing firm performance (Good & Michel, 2013; Hambrick & Quigley, 2014; Lin & McDonough, 2011; Mihalache et al., 2014; Mom et al., 2015; Owens & Hekman, 2016; Rogan & Mors, 2014; Stadler et al., 2014). If leaders manage to deal with the tensions that ambidexterity creates, ambidexterity can be promoted at all organizational levels (Knight & Paroutis, 2017b; Smith, 2014; Smith, Lewis, & Tushman, 2016). In this context, leaders can promote ambidexterity by exercising leadership directly through interpersonal interactions with the senior management teams and indirectly with middle management teams, which have direct communication with the senior management (Elenkov et al., 2005; Jansen et al., 2009; Shrivastava & Nachman, 1989). Therefore, leaders should consider all the internal factors, such as tensions/paradoxes (Angwin et al., 2009), as well as the external factors, such as the organizational structure and the dynamism of the environment in order to promote ambidexterity (Baskarada, Watson, & Cromarty, 2016; Davis et al., 2009; Jansen et al., 2009; Kortmann, 2011).

4.2.2 Contingency theory and leadership

The concept of ambidextrous leadership has received increasing attention in the study of leadership, but ideas of ambidextrous leadership have not yet had significant influence on the empirical leadership research. Most of the researchers agree that ambidextrous leadership includes a complex set of behaviors, those of cognitive and behavioral complexity (Jansen et al., 2016; Rosing et al., 2011). Effective leadership must include the ability to conceive and perform contradictory but complementary roles. Successful leaders must simultaneously focus on integration and differentiation, where factors typically treated as opposites are in fact closely related. Effective leaders must be loose and tight, creative and routine following, formal and informal (Andriopoulos & Lewis, 2009; Collinson, 2005; Raisch & Tushman, 2016). Therefore, they must possess a behavioral portfolio that is best suited to react to a complex, yet ambiguous organizational and environmental context (Denison, Hooijberg, & Quinn, 1995).

Several authors have attempted to define leadership in terms of a complex of behaviors (Bledow, Frese, & Mueller, 2011; Carmeli & Halevi, 2009; Denison et al., 1995; Havermans et al., 2015; Westley & Mintzberg, 1989; Yukl & Van Fleet, 1992). For example, Denison et al. (1995) note that if paradox exists in the environment, it should be reflected in leadership behavior. Two types of behaviors have been found to be especially representative of effective leaders, which may comprise the basis of ambidextrous leadership: consideration leader behaviors, where leaders invest in good interpersonal relationship and show support and concern for subordinates and initiating structure leader behaviors that provide structure to ensure task completion and goal attainment (Blake & Mouton, 1964; Galbraith, 1973;

Ginsberg & Venkatraman, 1985; Lawrence & Lorsch, 1968; Raisch & Hotz, 2010; Thompson, 1967).

More recently, Bonesso et al. (2014) have focused their attention, in their study, on the importance of individuals' prior work experience in order to examine leadership from a different perspective (see also Beckman 2006). More specifically, they found that prior work experience affects individuals' behaviors towards ambidexterity. Individuals that have developed their work experience only in the same business unit, fall into the situations of perceived personal ambidexterity and dominant learning orientation. Contrarily, individuals that have worked in several firms, units, and sectors that are different from that of their current company, fall into the situations of full personal ambidexterity and enacted personal ambidexterity. These individuals perform balanced (ambidextrous) behaviors if they have developed their experience from different positions for a long time (inter-functional, inter-firm and/or inter-industry experience), and in this way, they have managed to acquire a broad set of knowledge (Hambrick & Pettigrew, 2001; Junni et al., 2015; Mom et al., 2009).

4.2.3 Ambidextrous leadership, and transformational and transactional leadership styles

Existing contingency leadership approaches lack precision and action orientation (Lewis, Welsh, Dehler, & Green, 2002; Schindler, 2015). Therefore, in order to expand previous understandings (Vera & Crossan, 2004; Yukl, 2009) and outline concrete leadership actions, in this study, it is proposed that ambidextrous leadership is related to two leadership styles, transformational and transactional leadership (Baskarada et al., 2016; Bryant, 2003; Elenkov et al., 2005; Gratton & Erickson,

2007; Junni et al., 2015; Luo et al., 2016; Tung, 2016), based on the premise that ambidexterity has do with the simultaneous use of two contradictory, yet complementary leadership styles (Avolio et al., 2009; Bledow et al., 2011; Burns, 1978; Elenkov et al., 2005; Smith et al., 2016).

This is in line with Bass' (1985) assumption that all leaders exhibit characteristics of both transformational and transactional leadership styles, where individual leaders tend to put higher emphasis on one of these styles more than on the other (Smith et al., 2017), while the best leaders are those who display both transformational and transactional behaviors (Halevi et al., 2015; Vera & Crossan, 2004). Accordingly, Gratton & Erickson (2007) have also argued, in their study, that at the early stages, leaders were using transactional leadership (task-oriented), and at a certain point, they switched to transformational leadership (relationship-oriented) (see also Blake & Mouton 1964). Transformational leadership is found to be more likely associated with explorative innovation, whereas transactional leadership is more associated with exploitative innovation (Baskarada et al., 2016; Jansen et al., 2009; Luo et al., 2016; Wong, Lee, & Chang, 2017).

More specifically, transformational leadership has been suggested to highly relate to creativity and innovation (Bryant, 2003; Elenkov et al., 2005; Jansen et al., 2008; Jiang & Chen, 2016; Nemanich & Vera, 2009; Nijstad, Berger-Selman, & De Dreu, 2014; Rosing et al., 2011). Transformational leaders inspire and motivate employees to produce creative ideas and implement them in innovative products, while choosing what activities will be rewarded and what behaviors will be encouraged (Bryant, 2003). Therefore, transformational leaders are characterized by four separate

components: idealized influence (charisma), inspirational motivation, intellectual stimulation, and individualized consideration (the 4-i organizational knowledge framework) (Baskarada et al., 2016; Bass & Avolio, 1993; Bryant, 2003; Crossan, Lane, & White, 1999). They motivate followers to achieve superior performance by transforming followers' attitudes, beliefs, and values (Owens & Hekman, 2016; Rafferty & Griffin, 2004; Zacher, Robinson, & Rosing, 2016). At the same time, they inspire and motivate people that work with them, by communicating high expectations, using symbols, and expressing important purposes in simple ways (Bass & Avolio, 1993).

On the other hand, transactional leadership is associated with the exploitation of the existing knowledge (Bryant, 2003; Rosing et al., 2011). Transactional leaders demand task completion within a specific timeline, with employees following strict rules in order to achieve specific product goals (Baskarada et al., 2016; Tung, 2016). Transactional leaders clarify goals, reward goal achievement, and intervene only when necessary. They do not encourage experimentation, risk-taking, and tolerance for mistakes, and thus they are not expected to relate to creativity and innovation (Bass, 1999; Kang, Solomon, & Choi, 2015; Rosing et al., 2011). These leaders provide contingent rewards and are involved in active management by exception, so that individuals concentrate on efficiency and become better at performing current routines (Vera & Crossan, 2004). In this way, they contribute to high-level coordination of organizational activities (Jansen et al., 2009).

As the above activities of exploration and exploitation are different in nature, switching between them proves to be quite a challenging task (Adler, Goldoftas, &

Levine, 1999; Good & Michel, 2013; Keller & Weibler, 2014; Rosing et al., 2011). On the collective level, leaders must show both kinds of leadership capabilities to facilitate innovative performance among employees. When employees must be creative and generate ideas, then transformational leadership could promote innovation. In other situations, when efficiency and consciousness is called for, transactional leadership is more suitable (Zacher et al., 2016). On the individual level, leaders must be able to balance current and new activities, combine short-term and long-term thinking (Angwin et al., 2009), and develop emotionally engaging visions while staying focused on execution (Probst, Raisch, & Tushman, 2011). An illustration of the above concept is illustrated in Figure 4.1 below:

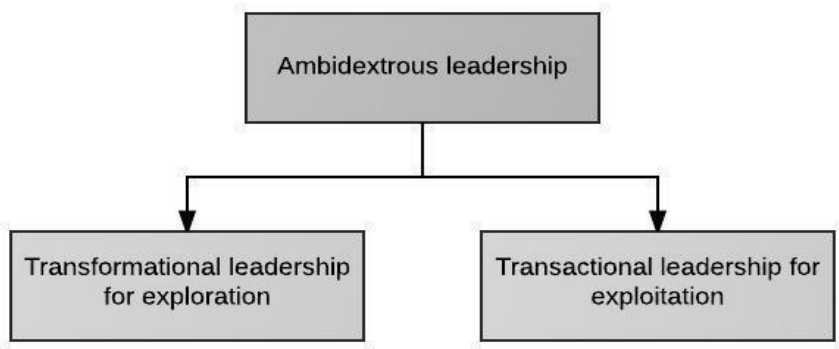

Figure 4.1: Ambidextrous leadership framework

Despite the above assumption that transformational leadership only relates to exploration and transactional leadership only relates to exploitation, research on the explicit relationship between transformational leadership–exploration and transactional leadership–exploitation remains limited and mixed. Thus, to be able to draw reliable conclusions, more studies are needed to investigate this link, as well as the boundary conditions of this relationship (Rosing et al., 2011).

In their theoretical study on ambidextrous leadership, Rosing et al. (2011) have proposed that even through these two leadership styles show positive relationship with innovation, they are still too broad in nature as they encompass a multitude of behaviors that may in fact both promote or hinder innovation (Avolio et al., 2009; Wofford, Goodwin, & Whittington, 1998). For this reason, they proposed opening and closing leadership behaviors that specifically match the requirements that teams and individuals face within the innovation process and the flexibility to switch between these, as the situation requires.

Particularly, opening leader behaviors that promote exploration are a set of leader behaviors that include encouragement for doing things differently and experimenting, thinking independently, and acting and challenging established approaches. Contrarily, closing leadership behaviors that promote exploitation are a set of leader behaviors that include taking corrective action, setting goals, and monitoring goal achievement. In their study, Rosing et al. (2011) distinguished between the two processes of innovation based on previous studies, which are idea generation or creativity (exploration) and idea implementation (exploitation). In Table 4.1 follows the adaption of transformational and transactional leadership styles to opening and closing leadership behaviors, where the term “behavior” emphasizes the higher situational ability in contrast with the term “ style” or “role” (see also Zacher & Rosing, 2015).

Table 4.1: Adaption of transformational/transactional leadership styles to opening/closing leadership behaviors (developed from Schindler, 2015, p.32)

	Opening leadership behaviors	Closing leadership behaviors
Transformational leadership	• A vision that motivates exploratory behavior • Stimulation of thought in new directions • Communication of the values of openness and tolerance	• A vision that motivates confirmatory behavior • Stimulation of small improvements and enhancement of efficiency • Communication of the values of conscientiousness and rules adherence
Transactional leadership	• Rewarding experimentation • Focus on errors to learn from errors • Setting and monitoring exploration goals	• Rewarding efficiency • Focus on errors to avoid errors • Setting and monitoring exploitation goals

In light of the above table, we must admit that leadership is a complex issue (Bass, 1999; Morrell & Hartley, 2006a). There are so many significant variables in establishing what is a good leadership that it becomes impossible to develop an experiment that will generate conclusive evidence on the topic (Avolio et al., 2009; Grint, 2001; Rogan & Mors, 2014). Today, the field of leadership focuses not only on the leader, but also on followers, peers, supervisors, work setting/context, culture, as well as a much broader array of individuals that include a whole system of variables. Therefore, leadership is no longer considered as an individual characteristic, rather it is described in various models as dyadic, shared, relational, global, strategic, and a complex social dynamic (Avolio et al., 2009; Yukl, 2013). Still, we can prioritize some of the most important characteristics about successful leadership. In this regard, successful leaders may have some of the basic characteristics that are present in all leaders, in addition to more specific characteristics that are dependent on their personal traits and behaviors (Blake & Mouton, 1964).

In sum, ambidextrous leaders must generate a clear and a relatively simple answer to what they want to achieve. The most important factor in ambidextrous leadership deals with the management of exploration and exploitation for the best possible outcome in terms of supreme organizational performance. Therefore, ambidextrous leadership is closely associated with high performance, and it depends on the extent to which leaders make their vision clear to their subordinates (Hambrick & Pettigrew, 2001; Probst et al., 2011), who must believe that they are capable of achieving highly imposed targets (Bledow et al., 2011; Grint, 2001). Success is both a social and an individual achievement (Groysberg & Lee, 2009; Pfeffer, 1994,

2005), and thus it is equally important for ambidextrous leaders to work along with their ambidextrous teams (Luo et al., 2016) toward a mutually agreed direction that embraces contradictory, yet complementary issues of exploration and exploitation (Carmeli & Halevi, 2009; O'Reilly & Tushman, 2011; Rosing et al., 2011). In Table 4.2, some key studies are presented that show the relationship between ambidexterity and transformational and transactional leadership styles.

Table 4.2: Key studies showing the relationship between ambidexterity and leadership styles

Author(s)	Year	Exploration/exploitation	Leadership styles	Key findings
Ambidexterity linked to both leadership styles				
Bryant	2003	• Exploration of knowledge • Exploitation of knowledge	Transformational/ Transactional behaviors	Managing knowledge includes three key processes of creating, sharing, and exploiting knowledge effectively. Leaders are central to each of these processes of managing knowledge at multiple levels of the firm. In this work, it is argued that transformational leadership may be more effective at creating and sharing knowledge at the individual and group levels, while transactional leadership is more effective at exploiting knowledge at the organizational level.
Jansen et al.	2009	• Exploratory innovation • Exploitative innovation	Transformational/ Transactional behaviors	This study advances prior research by linking transformational leadership with explorative innovation and transactional leadership with exploitative innovation. In addition, environmental dynamism is also taken into account, which promotes the effectiveness of the strategic leaders.
Rosing et al.	2011	• Exploration • Exploitation	Ambidextrous leadership through:	In this study, the authors propose an ambidextrous leadership theory, where exploration and exploitation

			Opening/closing leader behaviors	are linked to opening and closing leader behaviors.
Baskarada et al.	2016	• Exploratory innovation • Exploitative innovation	Ambidextrous leadership through: Transformational/ Transactional behaviors	This study provides support for ambidextrous leadership construct and links transformational leadership style with exploratory innovation and transactional leadership style with exploitative innovation.
Kauppila & Tempelaar	2016	Employees' ambidextrous behavior	Paradoxical leadership	This research demonstrates that both psychological factors and leadership style predict employees' ambidextrous behavior.
Luo et al.	2016	Ambidextrous behavior of top management teams (TMTs)	Ambidextrous leadership of chief executive officers (CEOs)	The purpose of this study is to investigate how the ambidextrous leadership of chief executive officers (CEOs) influences TMT members.
Transformational leadership style linked to exploration/exploitation				
Jansen et al.	2008	• Exploratory innovation • Exploitative innovation	Transformational leadership	This study explores the role of senior teams, attributes and leadership behavior in reconciling conflicting interests among senior team members, and achieving organizational ambidexterity. This study also shows that

				transformational leadership increases the effectiveness of senior team members in ambidextrous organizations.
Nemanich & Vera	2009	Ambidexterity through: • Exploration of new capabilities • Exploitation of existing capabilities	Transformational leadership behaviors	This study explores the role of transformational leadership and values in a learning culture that promotes ambidexterity in teams in acquisition integrations. The researchers find support for the association between transformational leadership and learning cultures.
Nijstad et al.	2014	Dissent-innovation relation in TMTs	CEO transformational leadership	In this study, the researchers link CEO transformational leadership with innovations implemented by TMTs. Results show that only under high levels of transformational leadership these innovations are radical
Jiang & Chen	2016	• Within-team knowledge sharing (exploitation) • External team knowledge acquisition (exploration)	Transformational leadership	This study explores how transformational leadership affects team's innovative performance. Results indicate that transformational leadership promotes within–team knowledge sharing and team's innovative performance.
Transactional leadership style linked to exploration/exploitation				
Vera & Crossan	2004	• Leadership styles on	Transformational/	The purpose of this study is to develop a theoretical

		organizational learning	Transactional leadership	model of the impact of CEO and top manager's leadership styles and practices on organizational learning. The researchers describe how strategic leaders influence each element of the learning system. They link transformational leadership with organizational learning, while also exploring the value of transactional leadership.
Kang et al.	2015	• Exploration of new knowledge • Exploitation of existing one	Ambidextrous learning	This study identifies two distinctive architectures of intellectual capital that facilitate ambidextrous learning. These architectures are defined as refined interpolation or specialist human capital and disciplined extrapolation or generalist human capital.
Zacher et al.	2016	Employees' exploration and exploitation behaviors	Ambidextrous leadership through: Opening/closing behaviors	The purpose of this study is to provide an initial testing where leaders' opening and closing behaviors can be positively associated with employees' exploration and exploitation behaviors and portray the influence on employees' innovative performance in exploitation activities.

More specifically, the above table is divided into three parts that present research where (a) ambidexterity is linked to both transformational and transactional leadership styles, (b) transformational leadership style is linked to ambidexterity, and (c) transactional leadership style is linked to ambidexterity.

The analysis of some current studies follows in order to explain what are the latest findings in the field of ambidextrous leadership. For example, one recent study where ambidexterity is linked with both transformational and transactional leadership styles is that of Luo et al., (2016), in which the researchers analyze the ambidextrous behavior of top management teams (see also the similar latest work of Kauppila & Tempelaar, 2016; Tung, 2016). In this work, the main goal of the researchers is to investigate how ambidextrous leadership of chief executive officers (CEOs) influences the ambidextrous behavior of TMT-members. They use a multisource survey, which reveals that TMT-members' ambidextrous behavior can be predicted by CEOs' ambidextrous leadership with the mediation of TMT behavioral integration and TMT risk propensity. TMT-members' behavior can be defined as the manager's behavior orientation in combining explorative and exploitative activities (Mom et al., 2009), whereas TMT behavioral integration refers to the mutual and collective interactions of the team members, and TMT risk propensity refers to the indirect relationship among group members.

In the latest study of Jiang & Chen (2016), transformational leadership style is linked to ambidexterity. The researchers conducted two studies to analyze how team members interact in order to understand how transformational leadership affects teams' innovative performance. In the first study, they used temporally assembled

teams working on innovative projects, where they found that transformational leadership promoted knowledge sharing inside these teams and in turn enhanced the team's innovative performance. In the second study, the researchers used permanent teams in various functional areas and found that transformational leadership along with external team knowledge acquisition promoted the team's innovative performance even further. They concluded the study by pointing the importance that transformational leadership has on enhancing collective innovation.

Finally, it must be stressed upon that only few studies link transactional leadership style with exploitation (Baskarada et al., 2016). One of the most well-known studies that links transactional leadership with exploitative innovation is that of Jansen et al. (2009). Recently, Kang et al. (2015), in their study, linked disciplined extrapolation with transactional leadership style, as they investigated how intellectual capital architectures interact with ambidextrous learning, while building a framework for human resource management. More specifically, the researchers identified two different architectures of intellectual capital, which they defined as refined interpolation and disciplined extrapolation. Refined interpolation is an architecture that includes specialist human capital, cooperative social capital, and organic organizational capital. Contrarily, disciplined extrapolation is an architecture that is comprised of generalist human capital, entrepreneurial social capital, and mechanistic organizational capital. The researchers also included two alternative HR configurations in their study that facilitate ambidextrous learning. They concluded that ambidextrous learning comes from intellectual capital architectures that in turn underlie unique human, social, and organizational capital configurations.

4.3 Leadership, and organizational and environmental constraints

Research has also shown that there is an interdependence among leadership, organizational structure, external environment, and performance (Baskarada et al., 2016; Davis et al., 2009; Eisenhardt, 2013; Elenkov et al., 2005; Havermans et al., 2015). Even though there are many definitions of structure, scholars emphasize the importance that structure plays on shaping the actions of organizational members. More specifically, structure constrains action. Thus, the more structured the organization, the less flexible is the behavior of individuals (Rivkin & Siggelkow, 2003), while a moderate structure is the most appropriate for balanced leadership actions (Davis et al., 2009). Accordingly, structure and performance present an inverted U-shaped relationship. Organizations with moderate structure seem to be high performing (Brown & Eisenhardt, 1997).

More specifically, a complex organizational structure becomes an obstacle by creating barriers to information sharing and cooperation. Different subunits, products, functions, priorities, and jargons for describing goals and actions may impede communication and discourage collaboration. For instance, in organizations where subunits compete for resources and power, employees may be reluctant to share information and innovative ideas with other subunits (Yukl, 2009).

In the same vein, environmental dynamism is a multidimensional construct. Nonetheless, as the environment becomes more dynamic, it becomes more advantageous for organizations to be more flexible and thus less structured, while in less dynamic environments, greater efficiency is needed, and thus more structures (Baskarada et al., 2016; Davis et al., 2009). Most importantly, this argument finds

support in a number of literatures and especially in the contingency theory (Davis et al., 2009; Galbraith, 1973; Jansen, van den Bosch, & Volberda, 2006; Raisch & Tushman, 2016; Thompson, 1967).

Therefore, based on the above premise, as far as ambidextrous leadership is concerned, in this project, I propose that medium dynamism environments favor organizations with moderate structures, which in turn are the most suitable to support balanced, ambidextrous leadership, and thus yielding high performance (Boumgarden et al., 2012; Davis et al., 2009; Dover & Dierk, 2010; Good & Michel, 2013; Jansen et al., 2009). Instead, less dynamic environments favor more structured organizations and thus lead individuals to less flexible behavior (Baskarada et al., 2016; Jansen et al., 2006). I call those individuals as ambidextrous managers, as they are mostly involved in exploitative activities, rather than in explorative activities, because the corporate structure constrains their actions (Boumgarden et al., 2012; Brown & Eisenhardt, 1997; Dover & Dierk, 2010; Mintzberg & McHugh, 1985; Rivkin & Siggelkow, 2003). Highly dynamic environments promote less structured organizations and thus favor individuals with flexible behavior (Baskarada et al., 2016; Good & Michel, 2013; Jansen et al., 2006). I call those individuals as ambidextrous entrepreneurs, as they are mostly involved in explorative activities and less in exploitative actions, as they are not constrained by the structure of their company (Boumgarden et al., 2012; Burns & Stalker, 1961; Dover & Dierk, 2010; Gilbert, 2005; Ozcan & Eisenhardt, 2009; Simsek et al., 2015). In Figure 4.2 below, the above concept is presented.

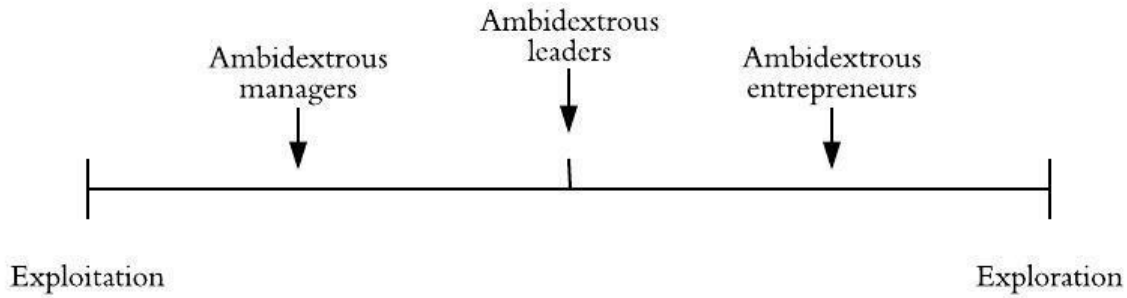

Figure 4.2: Ambidextrous leadership continuum (developed from Dover & Dierk, 2010, p.5)

In sum, this figure demonstrates the different approaches to ambidextrous management, the explorative and the exploitative activities, which are presented at the senior executives' level. More specifically, on the left end of the continuum, ambidextrous managers are placed, who tend to use mostly exploitative activities in their organizations. They are senior executives working in mature firms, with centralized structures and stable external environments. On the right end of the continuum, ambidextrous entrepreneurs are placed, who use mostly explorative activities in their organizations. They are top managers operating in novel companies or in small initiatives of mature organizations. They are not restricted by the rigid structure of their organizations (or the parent organization) and successfully manage to operate in dynamic environments. Finally, in the intermediate space between the two ends, ambidextrous leaders are positioned. These are senior executives, who manage to focus on both explorative and exploitative activities with equal effectiveness; their companies have reached an early mature stage but not yet acquired the rigidity of more established structures, and they operate in medium dynamism environments.

4.4 Examples of ambidextrous leadership

Following the above description of ambidextrous leadership, in this section, different examples on ambidextrous managers, leaders, and entrepreneurs are presented that operate in the high-technology industry (automotive, enterprise software, aerospace, and Internet) with high R&D intensity (OECD, 2011). The first example deals with Elon Musk, the CEO of Tesla Motors. His company's core operation has to do with the production of electric cars. Musk is a typical ambidextrous leader, as he operates in a company recently founded in 2003, which has already reached an early mature state with facilities located in different countries and multiple partnerships around the globe. The company has recently started to expand in other sectors beyond the construction of electric cars, such as in the production of solar roofs, solar home batteries (Powerwall), and energy storage solutions for commercial, industrial, and utility sites (Powerpack). Thus, he must focus on both explorative and exploitative activities with equal efficiency. A similar example of an ambidextrous leader is that of Baidu's Robin Li. His company has also been recently founded in the year 2000, and the company's core operation is Internet provision. This company has also reached early maturity and has started to expand in the areas of deep learning research and DNA copyright recognition technology.

A typical example of an ambidextrous manager is that of Oracle Corporation's Larry Ellison. His company's core operation deals with the production of enterprise software. This is a mature company with many years of operation since 1977, with complicated, multilevel structure and diversified products and portfolios in different areas, such as in the software (databases, applications, middleware), hardware, and development software sectors. For all the above reasons, he has to focus mostly on

exploitative activities to achieve cost efficiency in his company, while focusing to a lesser extent on innovative initiatives. On the other hand, Boom Technology's Blake Scholl is a typical example of an ambidextrous entrepreneur. He oversees a company recently founded in 2014, which has not yet reached maturity and deals with the construction of one main product. This is a small company, with few employees and therefore has a simple structure, and it operates in a dynamic environment of the aerospace industry. For this reason, he has to emphasize more on the explorative/innovative part of the product in order to expand the initiative to a larger scale. Below follows a more detailed description of the senior executives referred above, their companies, and some of their ambidextrous initiatives.

4.4.1 Elon Musk and Tesla Motors

A typical example of an ambidextrous leadership comes from the Tesla Motors' CEO, Elon Musk, who decided to invest in electric cars contrary to the market perceptions. Musk's long-term, strategic goal was to create affordable, mass-market electric vehicles. Tesla Motors gained widespread attention following the production of the Tesla Roadster in 2006, the first fully electric sports car. Musk took an active role in the explorative part of the Roadster production, as he personally oversaw the car's product design, engineering, and manufacturing. On the other hand, he also controlled the exploitative part of the car's production, by overseeing the daily operations for increased cost efficiency. These were the significant steps in his contribution to the firm's expansion and financial growth (Mangram 2012; Anon 2016; 10-K for the fiscal year ended December 31, 2014; Official Company Web Site, 2016).

4.4.2 Larry Ellison and Oracle Corporation

Accordingly, Larry Ellison is the co-founder and ex-CEO of the Oracle Corporation. He currently serves as the executive chairman and CTO of the company. Initially, Oracle became well known as a successful database vendor to medium- and low-range systems, while competing with companies such as Microsoft. Currently, the company designs, manufactures, and sells both software and hardware products, and it also provides financial, training, consulting, and hosting services that complement these products. The company has also proceeded with the acquisition of many other businesses and their product portfolios (Official Company Web Site, 2016). In 2013, the company released the latest version of Oracle Database, while the Oracle E-delivery service (Oracle Software Delivery Cloud) provides downloadable Oracle software and documentation (Radhakrishna & Shanmugam, 2015).

Ellison believes that the transformation of great ideas to great products is extremely difficult to do (Carmichael, 2016). For this reason, he took an active role in the explorative part of the Oracle software production, as he personally oversaw the software design and development, and product upgrading. At the same time, he has also controlled the exploitative part of the software production by overseeing the various licensing schemes according to customer requirements in order to achieve greater cost efficiency through targeted actions in the product production. As a result, Oracle software became progressively well-known through the years, and the company is currently expected to achieve a net income of $8.9 billion in 2016 (10-K Oracle Corporation 2015 Annual Report Form).

4.4.3 Robin Li and Baidu

Robin Li is the co-founder of the Chinese search engine, Baidu. The company offers many services for websites besides search engine, such as audio files downloading, sharing of images, online encyclopedia, and discussion forum, among others. It also offers wireless application protocol (WAP) and personal digital assistant (PDA)-based mobile search. In order to better compete with Apple Music, the company intends to proceed with the incorporation of Taihe Entertainment Group, which is going to be released in China, while it is also competing with companies such as Yahoo! China, Microsoft, Wikipedia, and Alibaba, among others (Official Company Web Site, 2016).

Robin Li took an active part in the explorative part of the launching of the company. In 1996, he developed RankDex, a method of hyperlink analysis, and he used this technology for the Baidu search engine. He also focused on powering the best technology, optimized for up-to-date local preferences, and tailored to unique customers' needs. And at the same time, he controlled the exploitative part of the search engine, through a careful management of financial expenses and human resource management, while also investing in simplicity and reliability (Official Company Web Site, 2016). As a result, Baidu grew since 2000 to the giant that it is today, ranking 4th in the Alexa Internet ranking, and the company has achieved an operating income of $1.7 billion in 2015 (Baidu investors press releases).

4.4.4 Blake Scholl and Boom

Finally, Blake Scholl is the founder of Boom Technology. He currently serves as the CEO of the company, and along with co-founders Joe Wilding (chief engineer) and Josh Krall (CTO), he oversees the production of the Boom supersonic aircraft. Boom Technology is a start-up company that was founded in 2014 (Official Company Web Site, 2016). Boom's airplanes will travel at more than twice the speed of sound and twice faster than any other airliner, and faster than Concorde (O'Hare, 2016). The plane is anticipated to make its initial subsonic flight in late 2017, with subsequent supersonic flight testing at Edwards Air Force Base, and companies such as Virgin Atlantic already hold options for Boom aircrafts (Norris, 2016).

Blake Scholl takes an active role in the production of the Boom airliner. Along with his colleagues, he oversees the explorative part of the airplane, which has a breakthrough design, state-of-the-art engine technology, and advanced composite materials. At the same time, Scholl controls the financial expenses (exploitative part) by using existing technologies to keep the costs low and promote the company's business model, which is based on their flights being about the same price as the business class is today in subsonic, wide-body airliners (Official Company Web Site, 2016). Also, according to the simulations, the plane is quieter and more efficient than Concorde (Diebelius, 2016). Despite the difficulty of attempting such a high-risk initiative, the start-up is funded by Y Combinator, Sam Altman, Seraph Group, 8VC, and some other angels (Kumparak, 2016).

A brief synopsis of the data presented about ambidextrous leadership and some of the ambidextrous initiatives follow in Table 4.3 below:

Table 4.3: Examples of ambidextrous leadership

CEO	Ambidextrous leadership	Company	Ambidextrous initiative	Ambidexterity management
Elon Musk	Ambidextrous leader	Tesla Motors	Tesla Roadster	**Exploration**: overview of the electric car design, engineering, and manufacturing **Exploitation**: control of financial and human resources
Larry Ellison	Ambidextrous manager	Oracle Corporation	Oracle databases (software)	**Exploration**: overview of the software design and development, and product upgrading **Exploitation**: control of various licensing schemes according to customer requirements
Robin Li	Ambidextrous leader	Baidu	Baidu (Chinese search engine)	**Exploration**: overview of massive amounts of investment, accurate anticipation of technology, market trends, and consumer needs **Exploitation**: control of financial expenses and human resources
Blake Scholl	Ambidextrous entrepreneur	Boom Technology	Boom supersonic aircraft (passenger airliner)	**Exploration**: overview of the supersonic aircraft production **Exploitation**: control of the financial expenses by using existing technologies to keep costs low and promote the company's business model, which is based on flights being about the same price as the business class is today.

4.5 Recent studies in the field of leadership

In their review of recent leadership literature, Avolio et al. (2009) argue that topics that are currently receiving attention with regards to research, theory, and practice in the field of leadership are those that examine authentic leadership and its developments (Gardner, Cogliser, Davis, & Dickens, 2011; Luthans & Avolio, 2003). Other topics that are also examined are new-genre leadership theories, which include theories of transformational and transactional leadership (Bryman, 1993), complexity leadership (Uhl-Bien, 2008; Uhl-Bien, Marion, & McKelvey, 2007), leadership that is shared, collective, or distributed (Pearce, Conger, & Locke, 2008), leader-member exchange (LMX) theory (Cogliser & Schriesheim, 2000; Colella & Varma, 2001; Graen & Uhl-Bien, 1995; Ilies, Nahrgang, & Morgeson, 2007), and followership (Learmonth & Morrell, 2016; Uhl-Bien, Riggio, Lowe, & Carsten, 2014). Finally, Avolio et al. (2009) also discuss the latest work of substitutes for leadership (Keller, 2006; Kerr & Jermier, 1978), servant leadership (van Dierendonck, 2010), spirituality and leadership (Dent, Higgins, & Wharff, 2005; Fry, 2003), cross-cultural leadership (Guthey & Jackson, 2011), e-leadership (Avolio, Sosik, Kahai, & Baker, 2014; Dasgupta, 2011), and strategic leadership (Carter & Greer, 2013), whose importance, although stressed upon, has nevertheless not been addressed adequately.

They conclude their study by pointing out that the evolution of leadership literature indicates different trends. The first trend shows that scholars are recently taking a more holistic view toward leadership, where they now examine all the angles of leadership, which include the leader, the follower, the context, the levels, and their dynamic interaction. The second trend includes the examination of how the process

of leadership takes place, and how both the leader and the follower process information and affect their environment, the other, the group, and the organization. The third trend involves alternative ways of examination of leadership through, for example, mixed-methods designs.

Based on the recent advances in the field of leadership, the main objective of this study is to examine the strategic leadership concept in more detail, which focuses on the top management level, and on the way, senior executives manage ambidexterity. This form of leadership is called ambidextrous leadership, which is considered by leadership scholars to be a recently addressed and investigated leadership concept. Therefore, it is within the scope of this research to make an important contribution to the field of ambidexterity and leadership and show how top executives manage explorative and exploitative activities in organizations.

4.6 Summary

In summary, in this chapter, the ambidextrous leadership concept is described in detail through the presentation of the contingency theory, which is linked to ambidexterity; transformational and transactional leadership styles are also used to describe ambidextrous leadership and structural and environmental constraints are taken into account, which restrict and influence leadership actions. More specifically, in this study, it has been considered important to explain that contingency theory is comprised of a complex set of behaviors. In accordance to organizational ambidexterity theory, these behaviors can be classified into two discrete types: consideration leader behaviors and initiating structure leader behaviors. However, transformational and transactional leadership styles were deemed to be more

appropriate to describe ambidextrous leadership, as they constitute two contradictory yet complementary leadership styles. Transformational leadership is linked to explorative leadership activities, which include motivation and inspiration of followers to achieve superior performance. On the other hand, transactional leadership is associated with exploitative leadership actions that include clarification of goals, reward of goals achievement, and intervention when necessary.

Moreover, in this study, ambidextrous leadership is considered to be influenced by structural and environmental constraints. Structure and environmental dynamism affect leadership actions. Therefore, less dynamic environments favor more structured organizations and thus encourage individuals with exploitative behaviors to accomplish cost efficient actions in their organizational setting. More dynamic environments favor more flexible organizational structures and thus require individuals with explorative behaviors that promote innovative activities in their organizational context. In between, there are individuals with balanced behaviors that promote both explorative and exploitative actions. These leadership types are classified as ambidextrous managers, entrepreneurs, and leaders respectively.

For a better understanding of ambidextrous leadership, examples of senior executives and their initiatives in high-technology industry have been presented in this research. More specifically, two ambidextrous leaders are described, who operate in recently founded companies, which have already reached a mature state and started to expand into different areas beyond their core product. Their organizations have branches in different countries, cooperate with multiple partners, and operate in medium dynamism environments. Thus, these ambidextrous leaders have to focus on both

explorative and exploitative activities with equal efficiency. In addition, a typical example of an ambidextrous manager is also introduced, who operates in a mature company that specializes in the high-tech industry for many years. The company has a structured organizational setting, with a diversified portfolio of products and stable external environment. For this reason, this ambidextrous manager must use mostly exploitative activities to achieve an efficient and lean organizational setting. Finally, a typical example of an ambidextrous entrepreneur is described, who operates in a recently founded company with simple structure and a few employees, which focuses on the production of only one product. Thus, this ambidextrous entrepreneur must focus on explorative activities to expand the initiative to a larger scale by pursuing innovative actions. Recent studies in the field of leadership are also discussed. The resulting framework of this chapter is graphically depicted in Figure 4.3.

In the following chapter, the research methodology of this research is described in detail. More specifically, a dual case study research framework is developed: On one hand, an international organization that serves as a customer for different defense projects, and on the other hand, three aerospace and defense companies that provide expert services and produce defense products. Data collection has lasted for more than two years, producing 44 interview outcomes (face-to-face and e-mail), while the study was enriched with multiple sources of evidence besides interviews, such as documents, archival data, web material, and observations.

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Ambidextrous leadership

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Figure 4.3: Summary graphic of chapter 4

CHAPTER 5

RESEARCH METHODOLOGY

5.1 Introduction

This chapter presents the logic of the research methodology employed in this study. Initially, the philosophical influences on the study and the research methods are introduced, which are followed by the description of the research context comprised of one international organization and three aerospace and defense companies. Then, the presentation of the data collection methods follows, that consists of interviews, documents, archival data, web material, and observations. Finally, this chapter concludes with the analysis of the data techniques employed in this research.

5.2 Philosophical influences on the study

This study is driven by the interpretive paradigm in social sciences, according to which the primary aim of the researcher is to understand the actors' first order perspectives. Therefore, the main objective of this research is to involve several initiatives based on the interpretivists' worldview, according to which the subjects of enquiry are people and institutions. Thus, the ontological and epistemological assumptions of interpretivism are influenced by the phenomenological premise that knowledge is constituted through actors' lived experience of reality, which creates the basis for action (Papachroni, 2013; Sandberg & Tsoukas, 2011).

Therefore, this research draws upon the interpretive tradition, according to which a social action cannot be understood unless the meaning that the social actors put themselves to this particular action is understood. In that regard, in order to understand the complexity of the world from the participants' perspective, the researcher must closely collaborate with the actors, so that they can share their views of their lived experiences (Baxter & Jack, 2008), and thus the researcher will be able to explore the logic of practice (Bourdieu, 1998). In this way, the researcher will be able to bridge the gap between theory and practice (Papachroni, 2013; Sandberg & Tsoukas, 2011). With regards to this study, the interviewed participants had the opportunity to unfold their opinions about ambidexterity and leadership, based on their personal views of how they perceive leadership and explorative and exploitative actions in their organizations.

Nonetheless, within the ambidexterity research such an interpretive approach is opposite to the prevailing rationalist approach, according to which ambidexterity is comprised of two distinct elements: (a) a set of properties that the individuals possess (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2011; Tung, 2016) and (b) a set of organizational structures and processes (Boumgarden et al., 2012; Raisch & Tushman, 2016). In this way, an approach of ambidextrous leadership from the actors' perspective and a shift to the exploration of ambidexterity through their experiences of exploration–exploitation tensions is offering a different path in the understanding of how ambidexterity can be achieved in practice.

Finally, while rejecting the idea of objective truth and aspiring to produce original contribution to knowledge, this research involves several decisions based on the

interpretivists/constructivists worldview. According to this view, the world where we live and work has a subjective meaning and a qualitative research approach provides the means to explore and understand this meaning by looking at the complexity of views rather than narrowing meanings into a few categories of ideas. This means that our personal, cultural, and historical backgrounds shape our research interpretations (Creswell, 2009). Based on the above logic, ambidextrous leadership is a concept that could be subjectively interpreted by the researchers based on their experience and knowledge.

As such, qualitative research approach was decided to be the most suitable approach to study this leadership concept, as other scholars have not previously examined this notion in much depth from a qualitative perspective, and existing theories do not provide sufficient explanation on this matter. In that regard, it is within the aim of this research to make an original contribution to the field of ambidextrous leadership, and more broadly to the field of strategic management, and show how senior executives manage exploration and exploitation in their organizations.

5.3 Research methods

This work is based on a dual case study research framework (Yin, 2009). This design allows for each case to confirm or contradict the inferences drawn from the other case and add confidence and generalizability to findings (Miles & Huberman, 1994; Yin, 2009).

The study involves two exploratory settings of leading organizations. On one hand, there is one international organization, which has a public-sector context, and on the other hand, there are three high-tech, aerospace and defense companies, which have

a private-sector context. These two settings were selected following ambidexterity research, such as that of Jansen, Simsek, & Cao (2012), as well as based on the criteria of ambidextrous organization defined by Tushman & O'Reilly (1997), which include: (a) firms that have ambidextrous senior and middle management teams who have the ability to understand and be sensitive to the needs of extremely divergent kinds of business, (b) firms that have a highly committed management with the ability to identify suitable market opportunities, and (c) senior management teams that have a clear vision of the company's objectives, which is evident in the way they balance exploration and exploitation.

Even though each subunit of the international organization under study has a different area of responsibility and objectives, the main goal of this research was to study ambidexterity processes (Miron-Spektor et al., 2017) that take place within each of these subunits, rather than investigate the exact nature of their operations. This is in accordance to Chang (2015) and Patel et al. (2013) who argue that ambidexterity found at unit level is similar to ambidexterity found at the organization level. In the same vein, the units in this research can be considered comparable in terms of ambidexterity penetration, as all of them have the common goal to seek ways to achieve efficiency and innovation in the projects where they are responsible. Therefore, their results, in terms of invested effort and achieved efficiency, can be extrapolated to the organizational level of the whole organization.

Finally, in ambidexterity studies, the performance measures are classified as objective or perceptual. Following a similar approach, in this research, the ambidexterity penetration of the organizations under study is classified as high or

low based on their ability to achieve balance between exploration–exploitation tensions across organizational levels. Therefore, the measurement of ambidexterity penetration in this study can be considered as perceptual. On the other hand, the leadership behavior is classified as explorative or exploitative via placement at the opposite ends of a continuum as two poles: leaders may choose to put higher emphasis on one pole compared to the other.

5.4 Research context

Choosing these settings with similar organizations of different structures that operate in the aerospace and defense industry gave me the opportunity to compare ambidextrous leadership between the companies. These organizations confront dual demands of exploring new products or processes and exploiting existing products or processes (Chandrasekaran et al., 2012), and thus they have the proper environment to study ambidexterity. In addition, their context is project based and commonly characterized by high pressure for ambidexterity (Havermans et al., 2015). The particular context of a large, international organization, along with the private organizations operating in the low-dynamism aerospace and defense environment, portrays a different environmental context compared to the highly dynamic context of high-technology that is addressed by most of the existing ambidexterity research. The key factors that determine the environmental dynamism in this sector are the number of competitors and the barriers of entry into the aerospace and defense sector.

Moreover, their different organizational structures (public vs. private) were chosen in accordance to Grint's (2001) leadership framework and Hill & Birkinshaw's (2014) proposition that firms use combinations of ambidexterity and thus ambidextrous

leaders in different organizational settings may have common behaviors. Therefore, these case studies provided a way of investigating how leaders make decisions enabling them to explore and exploit simultaneously.

Analyzing in-depth data over a time period of 20 months allowed the generation of novel insights into the patterns of decision-making in each case. The comparison across two distinct settings surfaced differential patterns of decision making (Smith, 2014). Table 5.1 summarizes the key information about the organizations under study.

Table 5.1: Overview of case firms

Case[a]	Services[b]	Specialization[c]	Industry	Year founded	Number of employees or member states	Annual revenues (millions)
International Organization	Eng.	System of collective defense	Military alliance	1949	28 member states	N.A.
Company 1	Eng., R., P.D., B.	Military aircraft, communication satellites and systems, electronic systems	Aerospace, telecommunication, electronics	2014 (from the merging of three subunits)	40000 (2015)	€14 billion (2015)
Company 2	Eng., R., P.D., B.	Defense electronics products, systems and applications	Defense electronics	2002 (from the splitting of the parent company)	50700 (2015)	€31 billion (2014)
Company 3	Eng., R., P.D., B.	Radar engineering (civil and military)	Software electronics	1983	300 (2015)	N.A.

[a] Pseudonyms are used for the protection of the international organization, private companies, and their employees

[b] Eng.: Engineering, R.: Research, P.D.: Product design, B.: Branding

[c] Information acquired from publicly available data

More specifically, on the one end, I decided to use data from an international organization that serves as a customer for different defense projects, and on the other end, I decided to use data from aerospace and defense companies that provide the expertise on and produce the defense products. As financial and human resources are scarce and the projects are broad in nature, these firms must identify opportunities to both leverage their existing competencies as well as build new capabilities. However, even though ambidexterity is usually studied in highly dynamic and research (R&D) intensive sectors, such as cultural (e.g. art, movies) and professional (e.g. medicine, law) industries (Andriopoulos & Lewis, 2009), in this research, aerospace and defense industry presents a special case because companies under study operate in a low dynamism environment and thus the context of their industry is different from the context of other highly dynamic industries.

Differences between the two settings also lay in the different strategic goals that these organizations pursue. The primary aim of the international organization is to ensure the protection of nations from external threats, as well as the internal security of its member states. The main goal of the aerospace and defense companies is to achieve high profitability based on the development of specific products both in the military industry, as well as in the civil aviation. While in the international organization decisions are made by consensus, after discussion and consultation among all the members, in the aerospace and defense companies, product strategy decisions take into account product opportunity, resources, technology, and financial viability.

All the above companies offer services based on defense products and electronics, with engineering being one of the most important services. Their external environment is of low to medium dynamism, as due to their size and high industrial barriers of entry, only few competitors of their size can engage into an on-par rivalry. Due to accessibility issues, more than one aerospace and defense company was chosen to increase the number of responses and achieve a relative balance between the public and private informants. Finally, these firms have a global presence and a multinational setting, and they exhibit diversity in size and age.

5.5 Data collection

Data collection of this research was intensive, spanning over more than two years. In the beginning, I decided to proceed with a thorough archival research of companies under investigation. These organizations were chosen for several reasons. First, their context has proven to be well suited to study innovation challenges and their management. Second, organizations were theoretically sampled to fit the research focus of this study (Eisenhardt, 1989). The four case firms are models of ambidexterity, renowned for their excellence in explorative and exploitative innovation within the intensely competitive aerospace and defense industry (Tushman & O'Reilly, 1996). Lastly, within this setting, specific firms were chosen, where a full access to their higher management could be obtained in order to study ambidexterity in much depth.

Moreover, in this study, multiple sources of evidence were used, such as (a) interviews (face-to-face and e-mail), (b) documents, archival data, and web material,

and (c) observations. Table 5.2 summarizes the data sources (interviews) per case. Initially, this study was initiated with archival material, and then interviews and observations were used as a source of inductive data. Also, archival data, documents, and observations were used to offer insights that could support the interview findings (Cassell & Symon, 1994; Langley, 1999; Yin, 2009).

Table 5.2: Data collected

Cases		**Interviews**				
		Higher management: Strategic business unit general manager/CEO	**Senior level management:** Strategic business unit senior leaders	**Middle level management:** Project leader/Division manager	**Employees:** Team members	**Total interviews**
International organization	Business Unit A				1	1
	Business Unit B	1		8	1	10
	Business Unit C		1			1
	Business Unit D	1		6	6	13
	Business Unit E			1		1
	Business Unit F			2	2	4
Aerospace and defense companies	Company 1	1	1	1	1	4
	Company 2	1	1	1		3
	Company 3	1	3	3		7
						Total: 44

5.5.1 Face-to face and e-mail interviews

In this study I decided to use both face-to-face and e-mail interviews (Appendices 1A and 1B). E-mail interviews were considered to be a good alternative to face-to-face interviews for several reasons. In the case of sensitive questions, the response rate was found to be higher and based on the quality of the responses obtained, it was revealed that the online research attracted more knowledgeable, viewpoint-oriented informants when compared to face-to-face interviews. In addition, face-to-face interviews appeared to be more susceptible to social desirability bias because of the interviewer's presence (Szolnoki & Hoffmann, 2013). Most importantly, the cost of conducting and transcribing e-mail interviews would be considerably less to administer than face-to-face interviews (Egan, 2008). In addition, the list of questions was deemed to be more effective via e-mail as it could be sent individually to several participants at once, irrespective of their geographical location or time zone (Bampton & Cowton, 2002; McKerlich, Ives, & McGreal, 2013). As both the private and public firms under investigation were based in different geographical areas, such as the US and different countries in Europe, this method of communication was decided to be more convenient; otherwise it would be difficult to reach the participants directly. For this reason, five face-to-face interviews were conducted with participants who were located near to the researcher, while all the other interviews were conducted via e-mails.

Moreover, the anonymity of informants increased the participation rate and produced high quality results. High-ranked participants who had tight time schedules were, especially, encouraged by e-mail interviews, as they were accessible in specific hours only, so these e-mails gave them the flexibility to reflect on the questions more

carefully, in their convenient time, and thus provide more accurate answers (Bampton & Cowton, 2002; Egan, 2008). There was also the capability to re-approach certain individuals with more specialized questions after the first round of interviews was processed and evaluated (McKerlich et al., 2013). This approach considerably increased the fidelity and the depth of the interview findings.

All primary interview questions were sent in one e-mail message to each participant, including the invitation for participation, background information about the research, instructions, and the interviews schedule (see also Appendices). The e-mailed questions were decided to be more self-explanatory than those posted face-to-face, with clear indication given of the responses required (Bowker & Tuffin, 2004). For this reason, a close attention to detail was paid, with attempts to reduce ambiguity and improve specificity, while avoiding the narrowing of participants' interpretations and constraints of their responses (Bampton & Cowton, 2002).

The study was continued with some follow-up questions (probes) (Appendix 1C) to elaborate and clarify participants' responses or to help elicit additional information and depth from informants (Bampton & Cowton, 2002; McKerlich et al., 2013). Not all the participants answered to the follow-up questions, without however creating any problems to the quality of data collected. In fact, the quality of the overall responses gained (in the first and in the follow-up questions) through this online research was much the same as responses produced in face-to-face meetings (Egan, 2008). For instance, some of the respondents provided very short and very precise answers, while others discussed their thoughts and experiences in much depth and detail. This was attributed to the fact that participants may have felt that e-mail

interviewing was empowering because it essentially allowed them to be in control of the flow of the interview (Bampton & Cowton, 2002; Bowker & Tuffin, 2004).

A total of 44 interviews were conducted with individuals directly involved in the innovation and cost efficiency process (e.g. senior executives, and project leaders, among others). Employees on multiple organizational levels were asked to nominate other employees to participate in the study to enable representative sampling. To further ensure that this sample included the most knowledgeable informants, a "snowballing technique" was employed. In that respect, the initial informants recommended others within their firm, who could provide more insight about the issue under investigation. The interviews conducted face-to-face were transcribed verbatim to ensure reliability (Bryman, 2012; Creswell, 2009, 2013; Saunders, Lewis, & Thornhill, 2009), while those conducted via e-mail were used in their initial form.

An interview protocol was designed with both exploration–exploitation tensions in mind, and successful ambidextrous leadership practices on different management levels. The interviews were conducted in stages. Initially, the questions were covering general topics, such as company history, level of management, number of years worked in the company and in the specific position, and key management responsibilities. The interview protocol of this study evolved systematically, as questions were revised and enriched at least three times. As Langley (1999) recommended, the study began with general research aims. Then, as data collection and analysis evolved, the interviews of this research had to become more focused. Within each firm, informants were continuously recruited until additional interviews

failed to dispute existing, or reveal new categories or relationships. While passing from general questions to more focused ones, certain distancing was considered necessary in order to separate what was really significant from what could be treated as merely noise (Langley, 1999). In that regard, at this final stage, theoretical saturation was achieved and managed to reduce researcher's bias (Bryman, 2012).

More specifically, three types of case study interviews were decided to be used: (a) prolonged interviews, (b) shorter interviews, and (c) survey interviews (Yin, 2009). In the beginning, a small number of prolonged interviews with some key informants was used that lasted for more than two hours (face-to-face interviews). My main task was to ask the informants about their interpretations and opinions about people working in their organization, their general insights of the organization, as well as explanations and meanings related to certain occurrences. In this way, informants provided useful insights about organizational ambidexterity concepts.

Then followed some shorter case study interviews, which were more focused and only spanned around one hour or so. The case study protocol was more focused on concepts regarding exploration–exploitation tensions in the participants' working environment, inside their projects and at multiple levels of management in the organization. In this way, certain findings were confirmed, while other topics of a broader, open-ended nature were considered to be irrelevant. The questions were expressed in a careful way, by using a subtle wording, in order to avoid biased comments.

Finally, the biggest part of the case study interviews used in the research included survey interviews, where a more structured questionnaire (e-mail interviewing with follow-up questions) was used. The survey was designed as a part of an embedded case study and followed sampling procedures and instruments used in regular surveys. In that regard, the informants' leadership perceptions of their superiors, the exploration–exploitation tensions inside current and future projects and at multiple management levels, as well as tensions among and between employees and their middle and senior management were studied in further detail (Yin, 2009).

In sum, the questionnaire was divided into four parts, based on Smith' s (2014) work on ambidexterity. It was modified to reflect this study's theory of ambidexterity and leadership. In that regard, in the first part, general research questions were included about participants' responsibilities, managerial level, and number of years worked in the organization. The second part was comprised of questions regarding ambidextrous leadership theory, such as transformational and transactional leadership concepts and their relationship with explorative and exploitative activities taking place in the organizations. The third part was comprised of more focused questions regarding ambidexterity practices and tensions at multiple levels: at the senior management level, in groups, and among employees. In the fourth part, the questions of general nature explored the organizational structure, strategy, and environmental dynamism of organizations under investigation. Finally, after sending the above questionnaire, the information obtained was edited in stages, summarized, and linked to face-to-face interviews to ensure objectivity and reliability.

5.5.2 Archival data

Internal documents and industry reports were examined. Articles and online materials related to firms were gathered. Also, employee handbooks and press releases were used. However, the biggest volume of the archival research came from Internet and web pages analyses. This data was mostly used in Chapter 6 that describes case studies' background, both in the international organization and in the aerospace and defense companies under investigation.

5.5.3 Observations

During site visits for the needs of the interviews, informal observations of a small number of key informants were conducted. The work environment was observed in one of the four case studies (in the international organization) and particularly Business Unit D. Daily routines and social interactions between team members and the higher management were recorded both on site, as well as during some of the friendly meetings with employees and management. A friendly environment was observed between employees and middle management, while a sense of obedience to the hierarchy was also noticed, as this was a military organization.

5.5.4 Data triangulation

Multiple sources of evidence were used as part of this case study research. A major strength of this data collection was the opportunity to use many different sources of evidence to increase the overall quality of the study. For this reason, a hybrid strategy of multiple sources of evidence was created to achieve an overall convergence of evidence and strengthen the construct validity of the case studies. In this way, multiple measures of the same phenomenon were achieved and the

participants' perspective was accurately recorded (Yin, 2009). Therefore, the interviews of this study were based on multiple hierarchical levels and in different business units in order to mitigate subject bias and provide a broader range of perspectives (Raisch & Tushman, 2016). Consequently, interviews, archival data, and observational data were triangulated to be crosschecked, to increase the accuracy of the data findings and the quality of the data output.

5.5.5 Data limitations and implications for the robustness of ambidexterity research

This research contributes to a growing stream of literature on ambidexterity, which argues for a more holistic and fine grained approach to the study of ambidexterity (Papachroni, 2013). However, the main limitation of this study is its relatively small-sized sample, as compared to the number and size of the examined organizations, which could have potentially given a greater understanding of ambidexterity at multiple levels and ambidextrous leadership in the aerospace and defense organizations. Nonetheless, different groups of participants from multiple levels in these organizations gave a broad and deep view of the context from a variety of sources and perspectives. In all, three private firms and one international organization were represented in the data samples, while data were also enriched with publicly available material and web information, which contributed to the enrichment of the findings of this study in general.

5.6 Data analysis

5.6.1 Data analysis: a multilevel approach to ambidexterity

Ambidexterity practices at multiple levels unfolded during the process of data analysis. More specifically, three steps of analysis were used, from raw data to the

final outcome based on Miles & Huberman's (1994) work. Systematic comparisons of data, emerging categories, and literature review helped in the development of cohesive constructs and the construction of a theoretical framework. Interview transcripts were also employed as primary data for the analysis. Interview summaries, to support and refine the interpretations of emerging categories, were used, and the framework of this study was based on recent research to guide the integration of categories into an overall framework of the ambidexterity penetration.

Step 1: As the first step, broad categories at each level were identified. In this way, patterns of innovation and cost efficiency were found among senior executives, as well as innovation and goals achievement in projects, and creativity and discipline among employees. More specifically, by examining all interview transcripts, exploration and exploitation patterns were identified at each level. NVivo software was employed for the conceptual coding of data. Initially, in vivo codes of first-order concepts were used that offered general insights into ambidexterity practices and penetration, and then some follow-up questions with informants followed in order to improve categorization.

Step 2: As the second step, links among the first-order concepts were identified in order to group them into second-order themes and then into aggregate dimensions. Concepts and relationships regarding ambidexterity were derived from the data.

Step 3: As the final step, the theoretical framework of ambidexterity penetration within the organizations was built. Accordance to the recent research on ambidexterity was sought and existing studies were used in order to refine the

appropriate labels and understandings (Andriopoulos & Lewis, 2009; Chandrasekaran et al., 2012; Papachroni et al., 2016). Thus, the emerging interpretations were organized into a multiphase, multilevel process model and a model of ambidexterity penetration in the organizations was produced.

5.6.2 Data analysis: ambidextrous leadership

Ambidextrous leadership characteristics unfolded during the process of data analysis. Three stages of analysis from raw data to the final stage were followed by using Miles & Huberman's (1994) approach. More specifically, systematic comparisons of data, emerging categories, and literature review were employed in order to develop cohesive constructs and construct a theoretical framework (Andriopoulos & Lewis, 2009). This data provided insights about the business context and leadership behaviors (Yin, 2009). Then, all the insights that accrued were shared with one of the key informants to validate its veracity and enhance its robustness (Lincoln & Guba, 1985).

Stage 1: During the first stage, after inserting all the transcripts into the NVivo software, answers were isolated into nodes that were created for each section, patterns of leadership characteristics were identified, and finally the key points made in the interviews were inserted into an Excel sheet (Blake & Mouton, 1964; Denison et al., 1995). In this way, it became clear that individuals in the organizations under study possess all the necessary characteristics of ambidextrous leaders, as they combine both consideration leader behavior and initiating structure leader behavior. During this stage, the average percentage of time used by leaders in each organization on exploitative activities was also measured, and the output was

categorized into two categories, those of the public and the private organizations. Certain participants' responses on the question related to the percentage of time invested by their superior on exploitative activities were not processed as it was deemed as unreliable or incorrect. The main reason being the fact that the provided percentages did not add up to the 100% of their superior's time used in both standardized, everyday activities and future planning.

Stage 2: In the second stage, the above patterns of leadership characteristics were used within each case, in order to group them into broader categories (Eisenhardt, 1989; Yin, 2009). During the process of coding the data, these patterns were used and crosschecked in order to develop broader codes, while similar leadership behaviors as referred by each individual were incorporated. The emerging leadership characteristics were categorized into transformational and transactional leadership styles, which revealed the most recurring leadership features. Then, the three most frequently observed leadership characteristics in each of the cases were chosen. Therefore, by comparing these key patterns that come from contingency theory and from transformational and transactional leadership styles, an overlap between the two theories was noticed, and this led to the assumption that key leadership characteristics are linked to explorative and exploitative leadership behaviors. An illustration of the above procedure is depicted in Appendices 3 and 4, where a visual representation of contingency theory and ambidextrous leadership in the aerospace and defense organizations are shown.

Stage 3: In the third stage, cross-case comparisons followed where standard cross-case analysis techniques were used (Miles & Huberman, 1994). Similar leadership

characteristics in both public and private organizations emerged, and key ambidextrous leadership features were found in all the organizations under investigation. Therefore, constant elements in both cases were identified, which ensured the validity of the theoretical findings (Eisenhardt, 1989). Finally, the mean of the percentage output of the time used by individuals in both public and private organizations on exploitative activities was used to specify the direction of either explorative or exploitative activities of leaders in each organization (Kortmann, 2011). This was employed to link micro-level leadership features with macro-level corporate environment, while considering organizational structure and environmental dynamism. The above estimation is depicted in Appendix 5, where the high percentage of the time that leaders invest on everyday activities shows that they invest most of their time on exploitative activities in all the organizations under study.

Concludingly, in this study, the theoretical framework of ambidextrous leadership was constructed, as well as accordance with the recent research on leadership was sought and achieved (Bledow et al., 2011; Bryant, 2003; Elenkov et al., 2005; Rosing et al., 2011; Smith et al., 2016; Zacher et al., 2016), and an agreement with existing studies was reached (Bass, 1985; Blake & Mouton, 1964; Denison et al., 1995; Galbraith, 1973) to refine the emerging labels and understandings.

5.7 Summary

In summary, in this chapter, the research methodology employed in this study is described in detail. In the beginning, philosophical commitments and research methods of this study are presented. Then follows the description of the research context of the organizations under investigation and the data collection and analysis

techniques. More specifically, this study is guided by the interpretivist/constructivist worldview that opposes the positivism of natural sciences. Qualitative research (interviews and observations) is the method of inquiry of interpretivism, and this type of research includes human element as it relies on how researchers interpret the information obtained through the study. In that regard, the interpretivist approach views reality as something subjective, which is based on meaning and understanding rather than on predictions.

Therefore, the research methods of this study are based on a dual case study research framework. The study involves two case settings of leading organizations: (a) one international organization and (b) three aerospace and defense companies. These organizations were chosen due to their different organizational structures (public vs. private). However, these companies have an ambidextrous setting, and they operate in the aerospace and defense industry; it is a fact that gives us the opportunity to compare leadership practices between the organizations, but at the same time, make generalizable conclusions about ambidextrous leadership and a multilevel management of ambidextrous activities in the industry based on the findings.

Data collection of the research lasted for more than two years, where multiple sources of evidence were used, such as face-to-face and e-mail interviews, documents, archival data, web materials, and observations. The data collection includes 44 interviews, and the data was analyzed in stages in order to understand how senior executives manage to balance explorative and exploitative activities and how ambidexterity is managed across multiple levels. The analysis of this study was based on Miles & Huberman's (1994) approach. Systematic comparisons of data,

deriving categories, and literature review were employed in order to develop cohesive constructs and to construct a theoretical framework of the subject under investigation. The transcripts of the participants' interviews were inserted into NVivo software and Excel sheets for a better processing of data. In this way, a theoretical framework of the research of ambidextrous leadership and a multilevel approach to ambidexterity were constructed. Besides, the study was also based on recent research and existing theories on ambidexterity and leadership in order to make an original contribution to the field of leadership and strategic management in general. The resulting framework of this chapter is graphically depicted in Figure 5.1.

In the following chapter, the case studies' background is presented. More specifically, the international organization and the aerospace and defense companies are described. In the beginning, their external environment is introduced, followed by the description of their internal organizational structure. Then, a more detailed analysis of their internal environment is made.

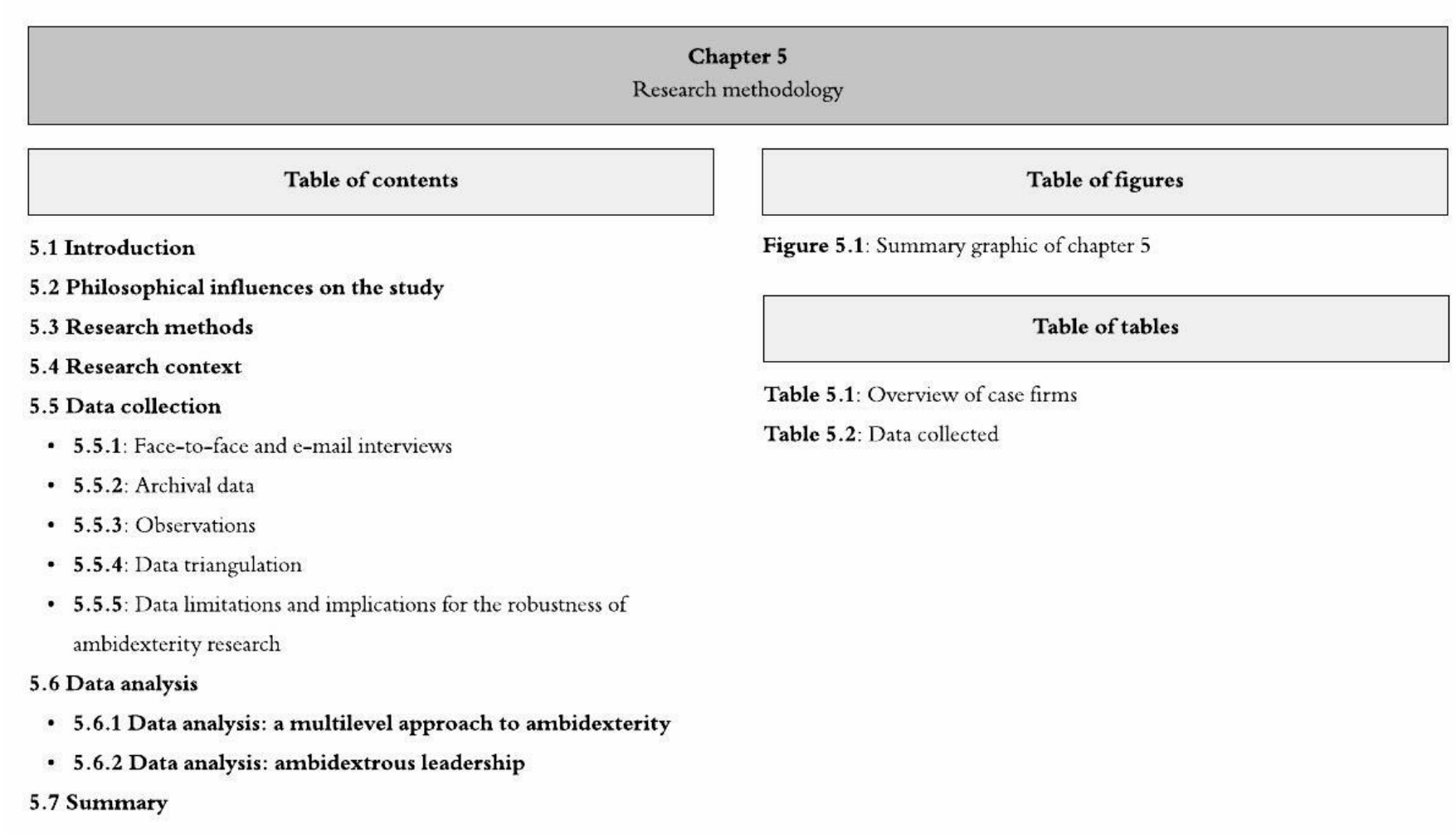

Figure 5.1: Summary graphic of chapter 5

CHAPTER 6

CASE STUDIES BACKGROUND

6.1 Introduction

This chapter describes the public, international (military) organization and the private, aerospace and defense companies. In the beginning, the chapter presents the industry context in which these companies operate, then it continues with the description of their organizational structure, and it concludes with a more detailed description of the companies' internal environment based on secondary data obtained from official web sites and press releases.

6.2 The international organization

6.2.1 The international security environment

The international security environment is changing. Concrete military threats are mutated into more vague problems that can arise far from a specific territory. Concepts such as democracy and peace need new approaches, so that they could be encouraged in various nations and regions. At the same time, new threats arise, which require new ways to address them, such as counter-terrorism, cyber defense, counter-piracy, energy security and missile defense (Weinrod, 2012).

The global political, economic, and military dynamics are also changing. Rising powers will play a larger international political and military role, whereas new

security threats could emerge from any corner of the globe and in diverse sectors. It is a fact that the current economic situation has contributed to the limitation of budgetary resources and has negatively affected defense spending, planning, programs, and military capabilities (PwC, 2014). In this challenging environment, population aging combined with increased immigration may have a negative impact on the personnel resources that can be committed to security services. The foreign energy resource dependence hampers the military planning and sustainability even further (Weinrod, 2012).

6.2.2 The internal organizational structure

Founded in 1949, the organization was initially established in order to protect state members from external threats. Its member states agreed for mutual defense in case of an external party attack. Gradually, the organization was decreased in size, where the number of units and overall staff were reduced, but more member states were included for increased stability, security, and democracy. After much consideration, the management of the organization launched military operations in the southeastern Europe. In this regard, it moved beyond its initially defined role of territory protection, to an overall military presence and influence in the Balkans area (Weinrod, 2012).

At the same time, it included additional countries that could participate in the organization's Partnership for Peace program (PfP) to encourage democratic security-sector reforms in various non-members countries (Official Web Page, 2015). In recent years, its role evolved even further in areas such as counter-terrorism, missile defense, cyber defense, energy security, and counter-piracy. For

this reason, the organization expanded its global ties with non-members even further, in order to strengthen bilateral relationships for security purposes. It has also developed partnerships with international organizations for security and political reasons (Weinrod, 2012).

Currently, the combined military spending of all the state members constitutes over 70 percent of the global total military spending (Birch, 2011). According to the Organization's Agreement, member countries should contribute 2 percent of gross domestic product on defense and cooperate to reduce expensive overlaps (Erlanger, 2014). Further, the organization is comprised of both civilian and military staff, and its equipment comes from member countries and in some cases, from partner countries or other troop-contributing countries (Official Web Page, 2015).

6.2.3 Description of business units

The research on ambidextrous leadership in the international organization was conducted in six high-technology business units described below. These units operate in a multinational environment in four European countries. In that respect, the first unit is based in the organization's headquarters in Brussels (Belgium), the second unit is situated in another location in Belgium, the third unit is located in Luxembourg, another two units are located in Netherlands, and the last unit is located in Germany (Figure 6.1).

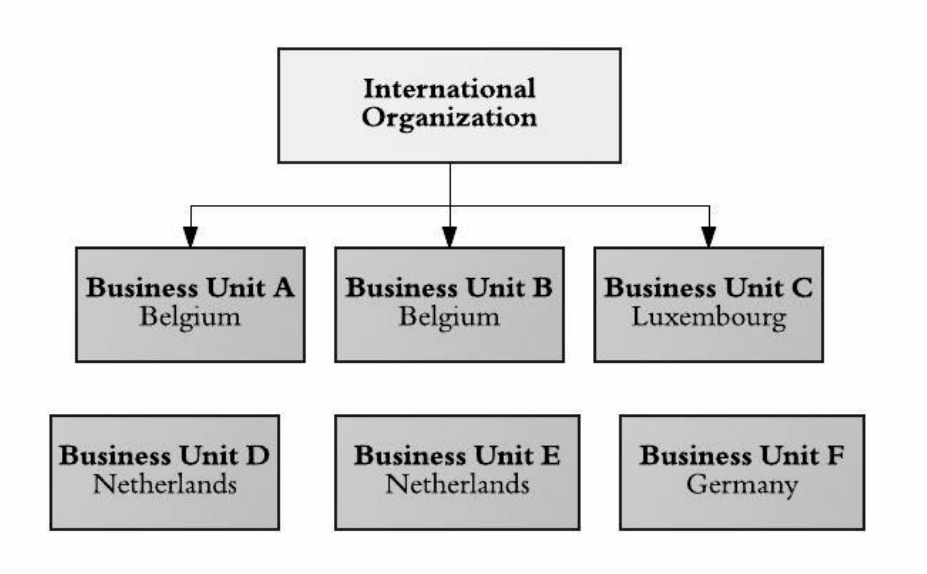

Figure 6.1: Business units in the international organization

Business unit A

Business Unit A is the organization's headquarters. It is the political and administrative center of the organization. In the headquarters, representatives of all the member states come together for consensus decision-making. The headquarters offer a venue for dialogue and cooperation between partner counties and member countries, enabling them to work together in their efforts to bring about peace and stability among themselves and with other non-member counties.

Roughly 4000 people work at the headquarters on a full-time basis. Meetings at the headquarters take place throughout the year, creating a setting for dialogue among member states. There is ample opportunity for informal and formal consultation on a continuous basis, a key part of the organization's decision-making process. More than 5000 meetings take place every year among different bodies of the organization, involving staff based at the headquarters as well as scores of experts who travel to the site (Business Unit A, Official Web Page, 2015).

Business unit B

Business Unit B is responsible for the planning and execution of combined, joint, effects-based operations. Presently, the unit promotes and oversees the continuing transformation of the organizational forces and capabilities, especially through training and development of concepts and doctrines. After 2002, when organizational structure was re-organized with a focus on becoming leaner and more efficient, the unit obtained more responsibilities. The current unit structure includes the Command Group, the Directorates, and the Special Staff. At the top of the structure is situated the commander, who is supported by the deputy commander and the chief of staff (COS). The chief of staff is represented by the vice chief of staff (VCOS). Overall, the number of staff that works at the unit is composed of approximately 1100 personnel (Business Unit B, Official Web Page, 2015).

Business unit C

Business Unit C is a customer-funded agency, operating on a "no profit-no loss" basis. Currently, it employs approximately 1100 staff. The unit brings together logistics and procurement support activities in a single organization, providing integrated, multinational support solutions for its stakeholders. Unit's primary customers are all country-members, more particularly the individual and joint materiel commands of their armed services. At the top of the unit structure is situated the General Manager, who is aided in his work by a number of high executives, such as Director Logistics Operations, Airlift Management Program Manager, Central Europe Pipeline System Program Manager, Procurement Director, Finance Director, and Chief of Staff (Business Unit C, Official Web Page, 2015).

Business unit D

In the second half of the 1970s, the requirement to manage the procurement and modernization of key operational assets led to the creation of Business Unit D, in order to make a contribution to the organization's deterrent posture. Implementation of the concept required a specific program and the establishment of a program management organization. In that respect, it was decided that the unit would be managed by a board of directors (BoD) and would be accountable to the member states. The BoD has delegated to committees the responsibility for the strategic planning and policy in the fields of operations, logistics, and finance. The BoD has been granted authority and independence in the management of the program, in the technical, initial system support, in financial and contractual areas.

Today, approximately 120 people man the business unit with various divisions or offices to organize the unit. The general manager is responsible to the BoD for the day-to-day management of the program and is aided in this task by a deputy general manager, a legal advisor and an internal auditor. The unit is responsible for planning and coordinating acquisition strategies and for managing contracts associated with the modernization of the equipment.

Organizational ambidexterity is especially important in this unit, which strives to respond to changing environments through the support of future operational capabilities (exploration), while responding to present continuous challenges (exploitation). This is achieved through the adoption of new business approaches, such as streamlined acquisition, in order to support the overall operational needs of the organization (*Business Unit D Information Booklet*, 2013).

Business unit E

Business Unit E is responsible for the contingency planning or regional defense scheme drawn up before 2010 that has to do with the organization's defense scheme for some of the European countries. The unit is adjusting itself such that it is a hub of joint expertise at the operational level– ready to innovate, adaptive to change, and driven to achieve ever increasing operational effectiveness. A commander, who is aided in his work by a deputy commander and a chief of staff, occupies the leadership position in the unit (Business Unit E, Official Web Page, 2015).

Business unit F

Business Unit F is an operational unit with surveillance capable assets. The unit's mission is to deliver surveillance services whenever and wherever directed by the organization. The build-up of the unit started in the late 1980s. The unit consists of five main functional areas: the operations, logistics, training, information technology, and headquarters as well as other normal staff functions. A senior level manager commands each of these major areas. Overall integrated manning of the unit consists of 2000 people divided in five subunits in five different countries. Facilities in Germany, where this study took place, accommodate 20 people. Their main responsibilities include the support of functions, such as base civil engineering, national support units, and morale and welfare activities (Business Unit F, Official Web Page, 2015).

In the Table 6.1 below, I briefly describe the main responsibilities of the business units under investigation in the international organization:

Table 6.1: A brief description of the business units in the international organization

International organization		
Business units	**Area**	**Description**
Business Unit A (headquarters)	Belgium	It is the political and administrative center of the organization. In the unit, representatives of all the member states come together for consensus decision-making.
Business Unit B	Belgium	The unit is responsible for the planning and execution of combined, joint, effects-based operations.
Business Unit C	Luxembourg	The unit brings together in a single organization logistics and procurement support activities.
Business Unit D	Netherlands	The unit is responsible for planning and coordinating acquisition strategies and for managing contracts associated with the modernization of the equipment.
Business Unit E	Netherlands	The unit is responsible for the contingency planning or regional defense scheme that has to do with the organization's defense scheme for some of the European countries.
Business Unit F	Germany	The unit is responsible to deliver surveillance services whenever and wherever directed by the organization.

6.3 Aerospace and Defense companies

6.3.1 The aerospace and defense environment

Aerospace and defense companies operate in low to highly dynamic environments. In large companies, the rapidly evolving and intensely competitive environment of the smallest units, with high risk and high mortality rates, requires the proper

leadership so that actions of innovation and efficiency are effectively executed and synchronized across their levels of management (Albers Mohrman & Von Glinow, 1990).

Aerospace and defense companies are considered to be the developers and users of the most advanced technologies. In this sense, they are expected to possess very high dynamism and potential growth. As they usually have multinational presence, they have become the most significant contributors to the growth of the economies of the countries in which they operate, as they commit very high financial investments and receive enormous revenues (OECD, 2011). Operationally, these companies extensively use software tools provided through Internet networking to enhance the communication between their departments that are spread across different continents and increase productivity through e-mail and teleconferences.

More specifically, aircraft and spacecraft industry (or global aerospace and defense industry) has one of the highest research intensities based on OECD classification of 10.29% of the total R&D investment (in 1999, in %) (OECD, 2011). Generally, A&D industry is expected to have high, long-term revenue growth rates. More particularly, the global aerospace sector's high growth rates are expected to be due to the accelerated replacement of obsolete aircraft with the next-generation fuel-efficient aircraft, as well as the continued increase in passenger travel demand. On the other hand, the global defense sector is expected to decline due to the cessation of a prolonged period of armed conflict without, however, affecting the overall future growth of the A&D sector (Deloitte, 2014; PwC, 2014).

A&D dependence on Internet will boost its growth even further. According to the International Telecommunication Union, Internet user penetration at this moment is 40% of the world population, forecasting the potential for a high growth in the next 15 years (ITU, 2014). ICT has become crucial in the recruitment of skilled workers from countries with low compensation rates, in finding the best partners from any given geography, for the consolidation and centralization of business information and enabling of secure access to anyone who needs it. In addition, Internet contributes to fast management decisions, improved access to key people, better collaboration capabilities, and access to the right information (Saksena, 2009).

Organizational ambidexterity is particularly important in A&D industry. A&D companies must constantly invest in innovative technologies, as competition in this industry is extremely fierce, with new competitors trying to take advantage of the growing market, especially from countries such as Russia and China (PwC, 2014). This complex and uncertain environment requires massive amounts of investment, accurate anticipation of technology, market trends, and consumer needs, as well as a high number of partnerships and acquisitions. On the other hand, A&D companies must operate in a lean organizational environment with controlled expenses, as it is extremely difficult to predict annual expenditure that fluctuates and may fall short of expectations.

An extremely important factor in preserving A&D industry efficiency depends on their ability to attract new employees and retain and motivate the existing ones. Still, they must be able to provide competitive compensation agreements to keep their expenses at the right balance, even though competition for qualified employees is

intense in their industry. As their organizations grow and they are required to implement more complex organizational management structures, they may find it increasingly difficult to maintain the beneficial aspects of corporate culture, which in turn could negatively impact their future success. Thus, ambidexterity proves to be essential in the management of the increasing complexity of the A&D sector.

6.3.2 Description of the aerospace and defense companies

In this study, I decided to use three aerospace and defense companies in the A&D sector to conduct my investigation on ambidextrous leadership. These private companies operate in a multinational, medium to high dynamism environment with their headquarters based in the United States (US) and Europe. Company 1 and Company 3 are based in Europe, whereas Company 2 is located in the US (Figure 6.2). A more thorough description of these aerospace and defense companies follows below.

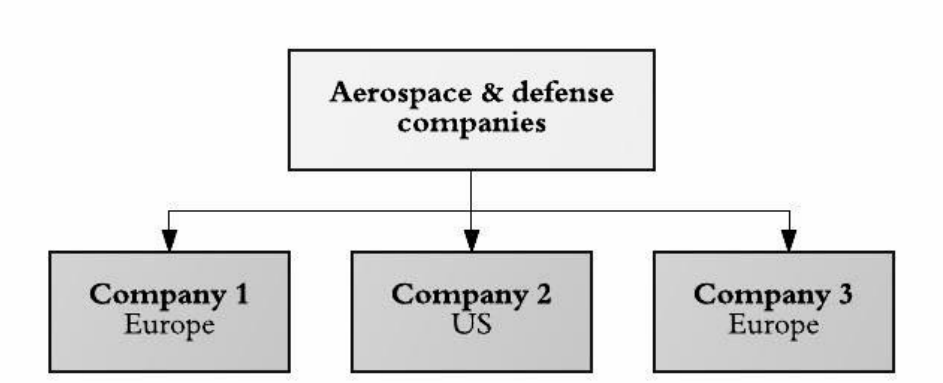

Figure 6.2: Aerospace and defense companies

Company 1

Company Group 1 is operating in the A&D sector, delivering both civil and military aircraft. The group employs around 63000 people at 16 sites in four countries: France, Germany, Spain and the UK. It also has subsidiaries in the US, Japan, China, and India. The group is divided into three business divisions.

In the late 1960s, the group began as a consortium of European aviation firms to compete with large American companies. The consortium was decided due to the fact that even though individual European companies were innovative, they still could not compete the dominant position of American aircraft manufacturers, as they had small production runs. Progressively, after successful deliveries of a large number of commercial flying aircraft, the group became increasingly interested in developing and selling to the military aviation market in the late 1990s. Expansion in the military aircraft market was desirable as it reduced its exposure to downturns in the civil aviation industry (Company Group 1 Website, 2015).

Company 1 is one of the group's business divisions, where the present study took place. It aims to develop and engineer cutting-edge and peerlessly reliable products in the fields of defense and space. More specifically, the company is providing innovative space systems; it is working on producing military aircrafts and is engaged in the field of communications, intelligence, and security, and it also provides innovative solutions in the field of electronics. At the same time, due to a close competition with a large American company, Company 1 aims to develop a broad product range for various segments in order not to compete with the major competitor head-to-head. For this reason, the company responds to the pressure of

the competition with models slightly smaller or bigger than the competitor to plug any holes in demand and achieve a better edge. At present, the company's revenue is €14 billion, while the working environment is multinational in nature, attracting engineering specialists, as well as other specializations from 86 different countries (Company 1, Official Web Site, 2015).

Company 2

Company Group 2 is one of the world's largest aerospace companies and manufacturer of commercial jetliners and defense, space, and security systems. The group supports customers in 150 countries, while employing more than 165000 people in more than 66 countries. At present, the group is organized into two business units: (a) commercial airplanes and (b) defense, space, and security. These units are supported by (a) a capital corporation, which is a global provider of the group's financing solutions, (b) a shared services group, which provides a broad range of services to company worldwide, and (c) engineering, operations, and technology, which helps develop, acquire, apply, and protect innovative technologies and processes (Company Group 2 Website, 2015).

Company 2 is one of the group's business units that specializes in innovative, capabilities-driven solutions across platforms, services, and support and information and technologies. Presently, the company is a $31 billion business that has approximately 51000 employees worldwide. Organizational ambidexterity is propelled through company's development scheme that brings the best of the best in development programs to ensure first-time quality, innovation, and repeatable performance. At the same time, the company has two joint ventures, which provide

reliable, cost-efficient services to governments and other companies (Company 2, Official Web Site, 2015).

Company 3

Company 3 is an engineering company that started its activities in early 1980s. Since then, the company has known a continuous expansion of its product range and the number of employees, which now approach 300. Many electronic measurement and test instruments useful in different application fields have been successfully developed by this company and have found their ways to markets all over the world. Today, the company is aiming to design and build reliable electronic measurement equipment and software for use in radar quality control and radar upgrade programs. The company is based in Belgium, and it has subsidiaries in the US, China, and the Asia Pacific area (Company 3, Official Web Site, 2015).

6.4 Summary

In this chapter, the international organization and the three aerospace and defense companies are described in detail. First, their external environment is presented and then their internal organizational structure is discussed. More specifically, the international organization is situated in the international security environment, where global political, economic, and military dynamics are continuously reshaping. The primary mission of the international organization is to protect state members from external threats. Gradually, the organization has changed in size and included more members for increased stability, security, and democracy.

This study included six high-technology business units in four European countries. The headquarters are based in Belgium, while the other business units are situated in

Luxembourg, the Netherlands, and Germany. Each business unit is responsible for specific duties. In that regard, the headquarters are the political and the administrative center of the organization. Accordingly, the other units are responsible for the following: (a) planning and execution of combined, joint effects-based operations, (b) logistics and procurement support activities, (c) planning and coordinating acquisition strategies and managing contracts associated with the modernization of key operational assets, (d) contingency planning or regional defense scheme that deals with the organization's defend scheme of some the country-members, and finally (e) surveillance services whenever and wherever directed by the organization.

Moreover, the aerospace and defense environment is comprised of large companies, as well as small, rapidly evolving and competitive business units. All these organizations commit high investments in novel technologies, while using cost efficient techniques to reduce expenses through highly educated employees and competitive compensation agreements. This research focuses on three aerospace and defense companies that operate both in Europe and the US. They deliver both civil and military aircraft, as well as other defense products and services. Their main responsibility is to develop and engineer cutting-edge and peerlessly reliable products in the field of defense and space. They also manufacture jetliners and defense, space, and security systems, as well as design and build reliable electronic measurement equipment and software for use in radar quality control and radar upgrade programs. The resulting framework of this chapter is graphically depicted in Figure 6.3.

In the following chapter, interview findings are presented that were retrieved from

participants' questionnaires in the international organization. The analysis of findings is divided into three parts: (a) micro-level analysis of ambidextrous leadership, (b) meso-level analysis of a multilevel approach of ambidexterity, and (c) macro-level analysis of ambidexterity management at the industrial level. Some initiatives of ambidexterity and leadership in the Business Unit D are also presented for a better understanding of ambidexterity management in projects and how ambidexterity is achieved at multiple levels.

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Figure 6.3: Summary graphic of chapter 6

CHAPTER 7

FINDINGS: INTERNATIONAL ORGANIZATION

7.1 Introduction

This chapter analyzes interview findings retrieved from participant questionnaires and face-to-face interviews in a public, international (military) organization. This organization requires the type of leadership that drives the effective management of innovation and cost efficiency. The ambidexterity approach is selected as the most appropriate approach to study leadership and organizational ambidexterity in its organizational set up. The chapter concludes with some initiatives that take place in the international organization.

7.2 Analysis of findings: international organization case report

7.2.1 Micro-level of analysis: ambidextrous leadership

Scholars claim that leadership is an important element for the promotion of ambidexterity in organizations. In the international organization under study, in multiple business units, leaders use a range of different leadership behaviors that are described by project leaders and employees in detail. Motivation, inspiration, expertise, and experience, as well as direction and guidance, coordination, and realistic objectives are considered to be some of the most important behaviors of leaders. Employees have also indicated what kind of leadership behaviors they anticipate from their leaders. For instance, a project leader in one of the business

units included in this study has described the kind of leadership behaviors that he expects from his superior:

> Working in a multinational acquisition agency requires an open mindset, motivation, some background of the different participating nations, detailed knowledge of the established working processes to provide clear guidance and very good communication/language skills (Project leader, Business Unit D, International Organization).

In that respect, good communication skills are considered to be one of the key factors of good leadership by most of the employees (consideration leader behavior). Most of them also believe that the ability to coordinate, control, and provide direction and guidance on different issues, the ability to prioritize events and assign the right responsibility to the right people, and the ability to coordinate activities with other departments and employees are also typical characteristics of effective leadership behavior (initiating structure leader behavior).

In addition, employees refer that leaders in the international organization use both transformational and transactional leadership styles. Some or all the attributes of transformational leadership promote exploration, with the most common component being the communication of high expectations, while inspiration, motivation, and individualized consideration are also present. In the case of transactional leadership, clarification of goals and intervention when necessary are the most commonly found attributes for the promotion of exploitation, while reward of goal achievement and management by exception seem to play an important role as well. As a project leader mentioned:

> Clarification of goals and then intervention when necessary are the most important factors in order to keep our everyday activities on track and to avoid deviations from initial goals. Sometimes, a reward is another practice to increase performance of working force under special circumstances, when there is lack of time or resources (Project leader, Business Unit C, International Organization).

According to the findings, the most important leadership behaviors found in leaders in the international organization based on contingency theory overlap with frequently used transformational and transactional leadership characteristics, which in turn are linked to ambidextrous leadership theory. In addition, project leaders and employees have reported that according to their estimation, their leaders use most of their time on the everyday or exploitative activities, and less time on the planning of future or explorative activities.

Finally, as the international organization has a public-sector structure, it is comprised of leaders that have preference mostly towards exploitative activities. They find it hard to be innovative, partly due to the top-down bureaucratic structure in the organization. This is in line with some key researchers' work (Davis et al., 2009; Mathias, 2014; Raisch, 2008; Raisch & Hotz, 2010), where efficient exploitation of existing capabilities in standardized, centralized, and hierarchical organizations that are situated in a low dynamism environment, impede creativity, innovation, and flexibility required for the exploration of new capabilities. As a project leader stated: "To the frustration of my superior, about 95% of his time is allocated to standardized/everyday activities, although he is trying to reduce it…" (Business Unit E, International Organization). According to other scholars, time spent by leaders on everyday activities shows that they work on the implementation and execution of the

existing ideas, a fact that is linked to exploitation, while time spent on future planning is linked to search, experimentation, and exploration of new ideas and thus to exploration (March, 1991; Papachroni et al., 2016). According to other scholars, time spent by leaders on everyday activities shows that they work on the implementation and execution of the existing ideas, a fact that is linked to exploitation, while time spent on future planning is linked to search, experimentation and exploration of new ideas and thus to exploration (March, 1991; Papachroni et al., 2016).

Therefore, based on the above findings, leaders in the international organization occupy the role of an ambidextrous manager and are mostly focused on everyday activities, while some of their time is also allocated on future projects and long-term planning of these activities. Thus, according to the above premise, in Figure 7.1 below, the ambidextrous leadership framework is briefly depicted in the international organization and some basic findings (illustrative quotes) are summarized about ambidextrous leadership in the organization under investigation in Table 7.1 that follows.

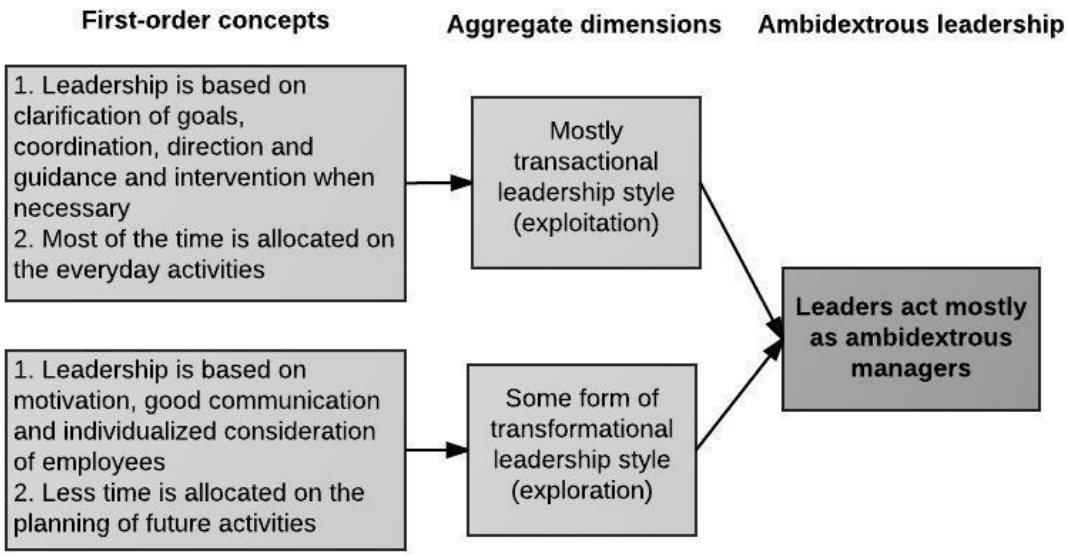


Figure 7.1: Ambidextrous leadership in the international organization

More specifically, this figure shows findings retrieved from participant questionnaires in the international organization, which are classified into first-order concepts and then into aggregate dimensions during the data analysis phase. In that regard, it demonstrates that ambidextrous managers in the international organization use mostly transactional leadership style, while due to highly centralized organizational structure with many organizational levels and a low dynamism external environment, they mostly focus on the clarification of goals, coordination, and direction. In addition, they provide guidance and intervene when necessary into the project management. On the other hand, they also use some form of transformational leadership style, where they motivate their employees, concentrate on good communication with all the parties involved, and focus on the individualized consideration of employees.

Table 7.1 below links illustrative quotes with contingency theory, which is comprised of two types of behaviors that have been found to be especially

representative of effective leaders and which may comprise the basis of ambidextrous leadership: consideration leader behaviors, where leaders invest in good interpersonal relationship, showing support and concern for their subordinates, and initiating structure leader behaviors that provide structure to ensure task completion and goal attainment. However, as it has already been mentioned in this study, existing contingency leadership approaches lack precision and action orientation. Therefore, in order to expand previous understandings and outline concrete leadership actions, in this research, it is proposed that ambidextrous leadership is related to two leadership styles, transformational leadership and transactional leadership.

Table 7.1: Summary of key findings (illustrative quotes) of ambidextrous leadership in the international organization

Business Unit/Company	Level of management	Leadership type	Quotes
Business Unit B	Project leader	Contingency theory	*The most important characteristics of the leader in my organization are: justice, stability, human interaction, ability to coordinate, control, and provide direction and guidance, expertise and patience.*
Business Unit B	Project leader	Contingency theory	*The leader in my company is exhibiting the following characteristics: experience, general and specific knowledge, patience and communication.*
Business Unit B	Project leader	Contingency theory	*Answer: 1st to love your job (most important), 2nd to have the ability to discriminate different situations and act properly especially in the occasion, 3rd to be open minded, 4th to be clever, 5th to be familiar with your job, 6th to study a lot, 7th to work hard, 8th to be methodic, 9th to trust your employee and your employee trust you, too. In my opinion, I think that the leader have to love his work and believe in an absolute way in the things that he says (to employees or others) (to use some methods to your leadership because you read some books or study this science in a university, this is not leadership. Leadership is something that source from your heart; it is not a recipe for cooking (deterministic) it is more stochastic). All of us want to be good leaders but you have to fight a lot for this and especially against*

			your ego (egotism).
Business Unit B	Project leader	Contingency theory	*I would say a meticulous study and knowledge, coordination with other departments and employees confronted with similar issues.*
Business Unit C	Senior executive	Contingency theory	*Planning, organizing, directing, controlling and properly delegating to the next lower management level. Of prime importance is monitoring progress and make re-adjustments (when required). My preferred management style is management by example.*
Business Unit D	Integrated product team leader	Ambidextrous leadership (transactional leadership–exploitation)	*Note for clarification to evaluate the figures: our job is executing/implementing the project, delivering the product on time, on budget, on requirements. Therefore, in this context, planning is associated with the activities that part of the look ahead / schedule*
Business Unit D	Higher manager/Director of unit	Contingency theory	*Communication and interpersonal skills, integrity, ability to motivate and inspire, problem solving skills and professional competence.*
Business Unit D	Project leader	Contingency theory	*Working in a multinational acquisition agency requires an open mindset, motivation, some background of the different participating nations, detailed knowledge of the established working processes to provide clear guidance and very good communication/language skills.*
Business Unit D	Project Leader	Ambidextrous	*Since future planning is currently one of our main tasks, it is at least*

		leadership (transformational leadership–exploration)	*30% of my superior's time. Daily business is mainly taken care of by my management level.*
Business Unit E	Project leader	Contingency theory	*The manager has to prove that he deserves his post by: understanding the environment of the organization he is about to lead, making contact with the challenges faced by his/her assigned personnel, setting ambitious but realistic objectives, be prepared to assume responsibility for his/her team, and setting the example for everyone.*
Business Unit E	Project leader	Ambidextrous leadership (transactional leadership–exploitation)	*To the frustration of my superior, about 95% of his time is allocated to standardized/everyday activities, although he is trying to reduce it…*
Business Unit F	Employee	Ambidextrous leadership (transformational leadership–exploration)	*I would put an average of 30-40% (i.e. on standardized everyday activities as based on the nature of our work there are only a few either standard or everyday events.*

The above table shows some of the illustrative quotes of participants about ambidextrous leadership in the international organization. It is divided into parts, while referring to leadership types that appear: (a) in different business units and (b) at multiple levels of management in the organization. For example, both project leaders and employees refer to different behaviors that they observe in their superiors that are in turn in accordance with some of the most important elements mentioned in the contingency theory. They also refer to transactional (exploitative) leadership styles of their superiors, as well as transformational leadership styles in many business units, which leads to the premise that there exists ambidextrous leadership in different business units and at multiple levels in the organization under investigation.

7.2.2 Meso-level of analysis: a multilevel approach to ambidexterity

In the international organization, exploration–exploitation tensions are managed on different levels, as they constitute a shared responsibility of all corporate members (Beckman, 2006). Even though there is a clear hierarchy in the business units with the senior executives making the decisions, there is a well-established process for the involvement of all stakeholders in order to facilitate a well-informed decision-making. There are two levels of decision power. The highest decision tier in some units of the organization is the Board of Directors (BoD), which meets twice a year; in coordination with the senior management, it is responsible for the decision-making, the strategic goals, and the financial processes, by using a top-bottom decision process.

However, there is a tendency to over-expand the stakeholder pool in order to dissipate the responsibilities in most issues. In that respect, all issues and goals are, in practice, managed and released at the lowest level of the hierarchy (middle-level management in coordination with employees) pursuant to respond to the delegation released by the highest level (senior-level management and BoD). For issues that are very important and that are related to financial processes and strategic goals, the highest level of approval is always required. Most of the time, there is a routing sheet going from the requester to the general manager with input from all involved departments. The final decision is made based on all the inputs.

As the project leader in Business Unit A explained in detail, "The Team Leader makes the project-specific decisions. The Program Manager makes the program-level decisions. The core team is dedicated on the specific project, and employees of other branches of the organization matrix/expert support when necessary. All matrix team members communicate their own positions during meetings, emails, phone calls to the Team Leader and when necessary to the Program Manager. The more effective means of coordination are the face-to-face team meetings (every 2 days of ad-hoc) and the daily emails. The driver of the decisions is primarily the achievement of the project level and (then) program level goals and objectives, with emphasis on the schedule, cost, and performance. Whenever needed or desired, employees of other branches of the organization or other external organizations provide expert support (legal or financial)".

Three tensions appear to be highly important for the promotion of ambidexterity in the organization at the three levels of analysis: at the senior management level, at the middle management level, and at the employee level (Andriopoulos & Lewis, 2009).

Ambidexterity at the senior management level

Ambidexterity is partly found at the senior management level in the organization. Cost savings (exploitation) are the primary goal of the senior management but not from areas where big savings could be achieved. In a lot of cases, the organization spends excess amount of money without examining more efficient ways to do business. Performance seems to matter most but is not achieved in a cost-efficient way. As the organization has a public-sector structure, it presents rigidity in transferring financial resources from one project to another, for a more prudent allocation of these resources.

At the same time, risk taking is not sufficiently supported, and thus opportunities and innovation or exploration do not constitute the primary means to foster even greater performance. More specifically, in most of the cases, senior management prefers to use technological advances in projects that have already been tested, rather than using new technology that may lead to the risk of incompatibility and thus result in the project's failure. As far as the allocation of financial resources is concerned, a project leader in Business Unit A explains it in detail: "Based on the current decision of our BoD, most of our resources are allocated to manage current projects. Nevertheless, there is a dedicated small Integrated Project Team (IPT) in place to start preparing for the future".

The senior management makes decisions at strategic– and sometimes at tactical or operational–level, while the execution of these decisions takes place at the project level (middle management). This is important to align strategic-level decisions with project level activities. The senior management makes the strategic-level decisions, while middle management offers them advice in procedural and technical matters. The project leaders have the freedom to make decisions on the procedural matters. In certain cases, the senior management requests proposals and assessments from the middle management, but this is more of an exception than a rule. An electronic engineer and project leader for team technical support put it as follows:

> Projects are mostly worked by Integrated Project Teams (IPTs). Based on the IPT recommendations, middle management provides a recommendation to senior management which makes the decision (Project leader for team technical support, Business Unit A).

In addition, alignment is achieved through supportive communications, trust, and clear messages. Formal meetings are held at project level at least once a week, and at senior management level weekly or monthly. Informal, ad-hoc discussions can happen any day. Most of the employees prefer to communicate informally in the beginning and then proceed to more formal communication and decision-making. As an Integrated program team leader in the Business Unit A explained: “I personally prefer ‘warming up’ the subject prior to critical decisions, which means let’s do the leg work informally first before going into formal”.

Ambidexterity at the middle management level

Ambidexterity is fully observed at the middle management level. Directors and project leaders seek to develop high-quality customer relationships. Particularly, in the international organization, there is not enough space for project leaders to deviate from the goals that have been set clearly in the beginning of the projects. However, on the way, they could improvise and try to implement their own style, in which their team should conduct daily business, as long as they stick to predefined timeline and budget line. As a communication engineer explained: "There is some freedom, but every deviation is talked through and agreed upon with the end user and then verified against the potential impact on schedule, performance, and cost'' (Business Unit A).

This is in line with one of the project leader's statement:

> Customer satisfaction in the organization is the main goal of the middle management and of course this can take many forms allowing thus room for maneuver (Project leader, Business Unit C).

> We are an acquisition (program execution) like organization with future planning capabilities as well. Planning is based on our "customer's" needs for modernizing and sustaining their assets and available budget that is provided by the "owner" of the assets (Integrated program team leader, Business Unit A).

Exploration in projects is also achieved in a certain way through the allocation of subject matter experts for the support of either ongoing projects or future projects planning. This is called "matrix" support, when the experts can be temporally assigned to other activities, while not having to leave their branch/division.

Ambidexterity at the employee level

Ambidexterity is partially found at the lower level of employees. Employees face interrelated challenges, which require discipline and creativity. On the one hand, they are asked to develop current or new products in short time frames with limited budgets (exploitation). On the other hand, creativity in teams is not considered to be of high priority (partial exploration).

More specifically, final decision is taken after cost efficiency and ideas used in the past are considered for similar or identical issues. Most often, these issues are discussed with other team members, but sometimes due to time constraints, there is little room to exchange ideas. The responsibilities are by nature related to specific goals and deadlines that do not allow much deviation, while they are also put in the framework of the statutory regulations. In some projects, due to their specific type, creativity is not required, whereas in some others, leadership promotes creativity but in restricted limits. However, flexibility is required when it can facilitate the progress of the project. Flexibility is promoted unless it is conflicting with particular rules. The leader/commander of Business Unit A explains it as follows:

> This is a mixed bag in our organization. I see some units collaborating and working in a creative manner and others working in stovepipes. Senior leadership encourages and promotes collaboration and creativity, but, frankly speaking, it could be better within our organization (Leader/Commander, Business Unit A).

Moreover, dialogue is used extensively among employees, particularly on issues which are complicated and touch many areas of responsibilities within the branch/section/unit. All discussions in formal forums take place under predetermined

policy. Employees discuss ideas within the IPT forums, and based on those discussions, they try to reach a common suggestion to the senior management, which makes the final decision. This is especially important, as it is essential to connect decisions across levels to ensure that the organization has the ability to align and adapt to changes. That means that execution and strategy need to be connected. This is in line with what an employee in the Business Unit C developed: “In general the ideas are discussed and when there is significant financial or operational impact, the decision making process invokes some of the widely used decision making tools, like decision matrix analysis, paired comparison analysis etc.”.

Experts that comprise the “matrix” structure are more flexible in producing innovative ideas and in knowledge sharing. Each expert has a unique area for which (s)he is responsible. Within the engineering team, everybody has the same level of voting opportunity for finalizing the recommendations for decisions. If there is no consensus at the lowest level, the issue has to be elevated to the next level. Responsibilities are formally recorded in the job descriptions, while creativity is recognized during task execution. Once creativity is recognized from any individual, then that person becomes the owner of that, and it is utilized in other areas.

Tensions

Everyday communication creates tensions within teams, as well as between employees and management. Within teams, different views, goals that need to be reached, and lack of specialized knowledge due to different academic and professional backgrounds lead to problems of understanding. On the senior management side, micromanagement, unjust or unequal treatment towards

employees, unclear guidance, and lack of technical knowledge lead to difficulties to understand the issues and come up with proper solutions. Also, when senior management bypasses the middle management and provides assignments directly to individual employees, a potential challenging problem arises.

As tensions are always emerging, there is a certain approach to ease tensions through regular, face-to-face meetings and through a discussion with the objective, as early as possible, of finding a solution that satisfies the majority of requirements for both sides. As a project leader in Business Unit B stated: “There are always tensions emerging. My personal approach is based on the gradual resolution of tensions, after having established my intensions and the limits of my tolerance. In principle, the higher an issue is being resolved, the worse it is for everyone”. Accordingly, an electronic engineer explained this issue as follows:

> Tensions are not very common, but whenever they arise they are the result of a common effort to comply to the tight implementation schedule. In my opinion, the easiest way to cope with such situation is to prioritize the issues according to severity, importance and impact and attack separately (Electronic/communication engineer, Business Unit A).

In sum, when analyzing the above tensions from a multilevel perspective in the organization, ambidexterity seems to exist at the senior management level. Still, neither cost efficiency (exploitation) nor innovation (exploration) constitute the top priority of senior management in the organization. Performance seems to be achieved in less cost-efficient way. In addition, ambidexterity at the middle management level is fully achieved, as project leaders do not have enough space to deviate from goals (exploitation), while creativity and improvisation are promoted well enough at the

team level (exploration). Finally, ambidexterity is also found, in part, at the lower level of employees. Even though current or new projects are developed in short time frames with limited budget (exploitation), creativity is not considered to be of high priority (exploration), except for creativity that is developed by experts that constitute the matrix structure. In Figure 7.2, a visual representation of the data structure and findings are presented, which show a low horizontal ambidexterity penetration across the levels in the international organization, and in Table 7.2, some of the most illustrative quotes are provided, which explain how ambidexterity penetrates across multiple levels in the organization under investigation in more detail.

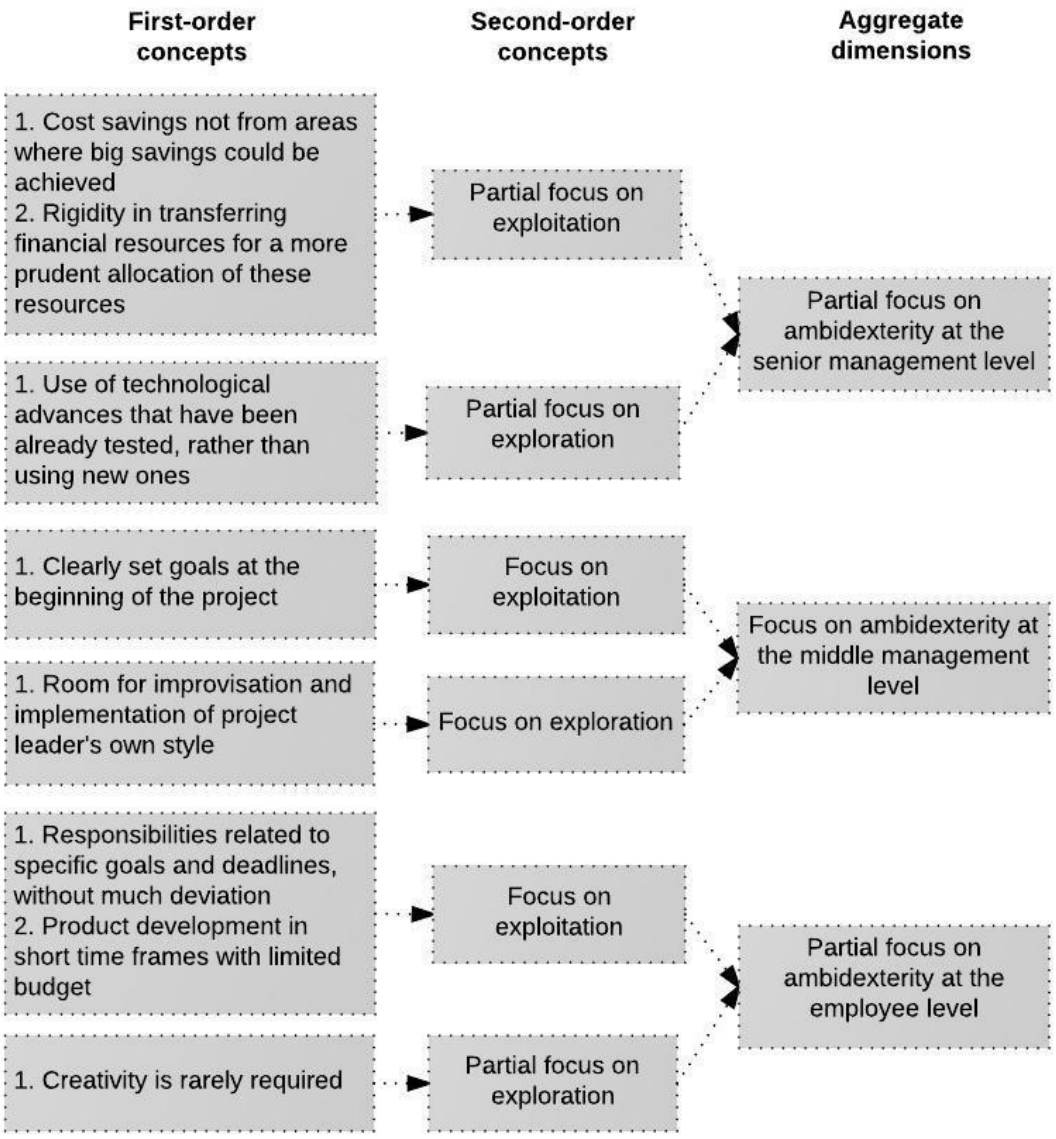


Figure 7.2: Low horizontal ambidexterity penetration in the international organization

More specifically, this figure demonstrates how ambidexterity penetrates at the horizontal level in the international organization, and it shows that there is low horizontal ambidexterity penetration in the organization. In the first column, first-order concepts are presented that are based on the statements of the majority of the participants. Then, these concepts are classified into second-order concepts on each

of the levels (senior, middle, and employee), and according to the theory, it becomes clear that there is only partial focus on the management of ambidexterity at the senior and employee levels, leading to the conclusion that there exists a low ambidexterity penetration at these two levels and thus a low overall horizontal ambidexterity penetration in the organization.

Table 7.2 below links illustrative quotes with ambidexterity penetration. As it has already been mentioned in this study, exploration–exploitation tensions are managed on the three organizational levels (senior, middle, and employee), something that is called horizontal ambidexterity penetration. More specifically, senior managers handle innovation and cost efficiency simultaneously at their level of analysis, middle managers handle innovation and goals achievement at the middle level, whereas employees manage their creativity and disciple in projects. Ambidexterity also penetrates vertically across all the three levels through organizational alignment, communication, and resolution of tensions of explorative-exploitative activities between individuals. Finally, ambidexterity can also penetrate throughout the whole organization, while taking into consideration the organizational structure, strategy, and environmental dynamism.

Table 7.2: Summary of key findings (illustrative quotes) of ambidexterity penetration at multiple levels in the international organization

Horizontal ambidexterity penetration			
Levels of analysis	**Business Unit**	**Job specification**	**Quotes**
Top management level	Business Unit E	Project leader	*In my current post there is a clear hierarchy, thus the command group is making the decisions. There is a well-established process for the involvement of all stakeholders in order to facilitate a well-informed decision-making. There is however, a tendency to over-expand the stakeholder pool in most issues in order to dissipate the responsibilities (with a lot of stakeholders, the blaming game is more difficult).*
Middle management level	Business Unit B	Project leader	*Middle management and even employees are allowed to have some ''decision making freedom,'' according to the limits set by the hierarchy and the relevant Directives.*
Employee level	Business Unit D	Employee	*-There is little room for improvisation as in this business the rules and processes are clearly defined.* *-I think that there is little room for creativity in my organization due to the particular type of the services that it provides. The bureaucratic structure is more helping than deterring the employees at their job.* *-However, there is some intra-team interaction at project level and sharing of knowledge experience. Especially between older and newer*

			employees than are not yet knowledgeable with the processes.
Vertical ambidexterity penetration			
Top-middle	Business Unit C	Employee/ Project leader	*Between employees and senior management there is sometimes lack of information flow on mainly on the future projects and goals of the Organization. This is compensated by the so called town hall meetings where all the employers are invited and receive informative briefings.*
	Business Unit F	Employee	*Unclear guidance and unclear assigned responsibilities lead to less than ideal handling of programs. Mostly, a straightforward discussion solves the miscommunication and misunderstanding.*
Middle-individual	Business Unit A (headquarters)	Employee	*-Tensions immerge between employees and management concerning issues like recognition of efforts and respective rewards. Additionally, it is extremely important from the management side to be able to clearly describe the needs and requirements. If I were in the position to cope with these problems I would acknowledge the work that everyone has dedicated, I would keep the personnel motivated and enthusiastic.* *-At my level of management we have on a daily basis, one formal meeting. In my opinion, it will be in the best interest of our organization to have both formal and informal meetings.*
	Business Unit B	Project leader	*Formal and informal meetings at my level of management may take place on a daily basis. Both are necessary for the promotion of the assigned*

			tasks, depending on the occasion.
	Business Unit C	Employee/ Project leader	*Between of employees I would say the problem in communication arises in the different interpretation/understanding of what needs to be done to accomplish certain tasks.*
	Business Unit D	Employee	*Formal meetings are held at project level twice a week and at senior management level weekly. Informal communication is welcome but formal is also necessary so that the tasking is clearly defined.*
	Business Unit E	Project leader	*-Informal communication is the best as long as everyone realizes they are on the same boat. Unfortunately, this is rarely the case, thus formal communication is the remaining alternative. All discussion in formal forums takes place under predetermined policy. The place where free exchange of ideas takes place is the coffee break and the launch brake.* *-There are always tensions immerging. My personal approach is based on the gradual resolution of tensions, after having established my intensions and the limits of my tolerance. In principle, the higher an issue is being resolved, the worse it is for everyone.*
	Business Unit F	Employee	*-Discussion within the team and the immediate supervisor. The outcome is later presented to higher management for approval. Rarely, but not impossible, our suggestion is not accepted and we need to go back and refine it.* *-We have established a weekly Staff Meeting, where each individual*

			present his progress with his assigned program. Normally though, since our offices are located very close to each other, we have an everyday interaction with the Branch Chief.
Organizational ambidexterity penetration			
Organizational structure	Business Unit A (headquarters)	Employee	*-Performance and cost efficiency are both considered in any decision. In most of the cases the performance is limited in order to accomplish cost efficiency* *-The planning is indicated by the organization and approved by the parent organization, which also acts as the supervising authority.* *-Most efficient: speedy decision taking, cost efficiency, adopting policies, standardization* *-Less efficient: innovative ideas, performance, productivity, flexibility*
	Business Unit E	Project leader	*All measures of effectiveness are dictated by parent organization, by setting the standards (the limits) of business. The organization is most efficient in achieving required objectives, less efficient in creating innovative ideas.*
Environmental dynamism	Business Unit E	Project leader	*Low dynamism environment (few competitors, high barriers of entry)*

The above table shows some of the illustrative quotes of participants about ambidexterity penetration at multiple levels in the international organization. It is divided into three parts based on (a) horizontal penetration at the three levels (senior, middle, and employee), (b) vertical penetration between top-middle and middle-employee levels, and (c) organizational penetration in the organization, while taking into consideration organizational structure and environmental dynamism of the aerospace and defense industry. For example, both project leaders and employees refer to their main focus on exploitative activities in their business unit, where they use a well-established process for the involvement of all stakeholders, in order to facilitate a well-informed decision-making. Accordingly, middle-level managers and employees describe the difficulties and tensions in their communication with senior executives and other employees and how they overcome any communication problems. Finally, participants discuss how performance and cost efficiency are considered in any decision and they all refer that they operate in a low dynamism industrial environment. Finally, participants report how performance and cost efficiency are considered in any decision making process and every single interviewee indicates that the organization operates in a low dynamism industrial environment.

7.2.3 Macro-level of analysis: organization in its industry context

There is interdependence between organizational structure, strategy, organizational external environment, and ambidextrous leadership in the international organization. Based on this premise and according to Miles & Snow's (1978) adaptive cycle, the organization belongs to a particular structural configuration that is called the defender. This organization, through highly centralized actions and managerial

decision-making, achieves to maintain a stable and predictable organizational environment, while operating in a low to medium dynamism external environment. It places emphasis mainly on exploitation, while partially ignoring developments and trends outside its domain. In order to achieve cost efficiency, its employees communicate through formal hierarchical channels at different organizational levels.

The strategic orientation of the organization is based on the goals set either by the higher management or the Board of Directors (BoD) or the higher echelon parent organization/headquarters that provide certain cases to the senior management. Then, the program manager makes the program-level decisions and the team leader makes the project-specific decisions. The core team is dedicated on the specific project and is matrix supported, whenever necessary, by employees of other branches of the organization. All matrix team members communicate their own positions during meetings, emails, or phone calls to the team leader and, when necessary, to the program manager. The driver of the decisions is primarily the achievement of the project-level and then program-level goals and objectives, with emphasis on the schedule, cost, and performance. Whenever needed or desired, employees of other branches of the organization or other external organizations provide expert support. An integrated product team leader stated it as follows:

> At strategic level (agency), we set annual goals and objectives and we assess achievements at end of calendar year. At the project level, we start from the annual goals and objectives and then break them down to quarters (i.e., 90 day look ahead). We are allowed to adjust objectives and scope based program schedule changes; however, we do not deviate from the final goal. So, certain freedom is allowed, but that is always coordinated at the project level (Integrated product team leader, Business Unit A).

The short-term strategy of the organization is to keep the schedules, costs, and performances of all its projects in good fitness and resolve on daily basis any delays, shortfalls, issues which drive current risks or may drive future risks to the delivered products of capabilities (exploitation). The long-term strategy is to invest in future projects and capabilities (exploration) but also to achieve the sustainability of the current projects.

More specifically, the organization considers cost efficiency (exploitation) as a major driver for its long-term decisions. The key strategy is to achieve the best product with the available funding. The balancing of cost, schedule, and performance or technical compliance is achieved primarily by activities to adapt firstly the schedule and secondly (if needed) the performance elements to achieve the cost element. Cost, schedule, and performance are negotiated with the contractors. Depending on the particular situation, any of the three elements may be the priority and receive precedence. In that respect, during periods when multiple, inter-related projects are in progress, the schedule is the key element that receives precedence even at a higher cost. The decisions on the precedence are made at strategic level by senior management and are passed to the middle management (project leaders) as organization policy. In that respect, this distinct mechanism aligns and adapts strategic level decisions with project-level decisions:

> We have 3 pillars for each project, which are cost, schedule, and performance/technical compliance. We have a very comprehensive & rigorous process to balance among these 3 pillars (Integrated product team leader, Business Unit A).

There is a high importance of a continuous planning process in assessing the exploration or exploitation decision risk. A continuous planning approach requires business units to continuously monitor technology and market changes and to incorporate them into their decision-making process. Also, planning ensures a high level of coordination among individual entities and enables faster response to changes. In that respect, planning in the organization is dictated by the parent organization, which sets the operational requirements. These drive the technical requirements of the projects. The internal planning of the projects is performed daily by the project leaders, weekly by the program managers, and in longer intervals by the senior management. The Integrated product team leader notes the following about the planning process: “We are an acquisition (program execution) like organization with future planning capabilities as well. Planning is based on our “customer’s” needs for modernizing and sustaining their assets and available budget that is provided by the “owner” of the assets (Business Unit A)”.

Moreover, the control system is implemented in a decentralized fashion, starting from the high-level supervision and control by the Board of Directors to the senior management to the lower levels of control exercised by the program managers and the project leaders. Supervising authority ensures that the organizational goals are accomplished via audits, inspections, and evaluations, while the middle management is responsible for the budget and the schedule implementation.

However, despite the strict emphasis on goals achievement, the organization is considered to be less efficient in the speedy accomplishment of these goals, creation of innovative ideas, introduction of changes, and providing proper motivation to the

employees (i.e. in the explorative activities). When there are complex issues, they also create inefficiency as there are a lot of variables that have to be taken into consideration and many units or teams are involved. Numerous times, a decision is driven by the operational necessity, which in turn is independent of a price tag. On the other hand, the organization is most efficient in areas of communication with all the stakeholders, and internal coordination (i.e. in exploitative activities). All the involved members set clear and concrete goals of a task or exercise, with measurable benchmarks and agreed upon deadlines.

Finally, different organizational ambidexterity approaches are promoted in the organization. In that regard, it exhibits a *contextual ambidexterity approach* with the simultaneous engagement of organizational members in exploration and exploitation in a single unit. For example, there are teams that work on both future and current projects as experts coming from other branches/sections of the same organization (matrix support). In addition, the organization exhibits a *structural ambidexterity approach* with different exploitation and exploration units that mostly emphasize exploitation. For instance, multiple project teams work on the current projects and only one team works on the future project. *Punctuated equilibrium* is also used in teams that devote their time on current projects first and then on future projects or vice versa, based on prioritization. In Figure 7.3, three out of four ambidexterity approaches found in the international organization under investigation are briefly described.

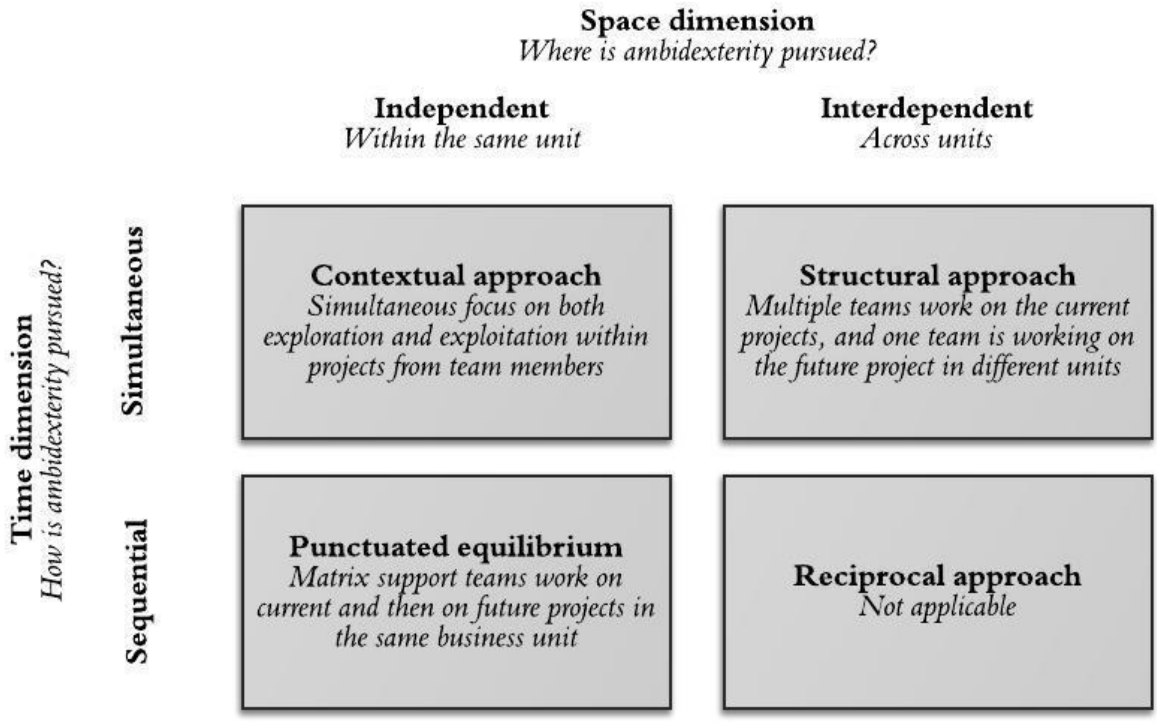


Figure 7.3: Ambidexterity approaches in the international organization

According to Birkinshaw & Gupta (2013) and based on Simon's (1962) argument, organizations are nearly decomposable systems, with parts that communicate with each other. Therefore, effectively managed organizations must have some blend of exploration and exploitation at each level. In addition, according to Hill & Birkinshaw (2014), all the ambidexterity approaches are not seen strictly as alternatives to each other. Firms are expected to utilize various combinations while seeking to better employ ambidexterity in their organizational context. Therefore, they are expected to pursue hybrid forms of organizational ambidexterity or hybrid ambidexterity. This research supports these assumptions and shows that three out of four approaches, as described in the above figure, are used in the international organization under study. In Table 7.3 that follows, this section concludes with a summary of key findings presented in this chapter.

Table 7.3: Summary of key findings in the international organization

Organizational ambidexterity in the international organization	
Levels of analysis	**Description**
Micro-level of analysis: ambidextrous leadership	Leaders act mostly as ambidextrous managers. Most of their time is devoted on everyday activities (exploitation), while some of the time is used on future planning (exploration). • **Transformational leadership**: motivation and individualized consideration • **Transactional leadership**: clarification of goals and management by exception
Meso-level of analysis: a multilevel approach to ambidexterity	Low overall ambidexterity penetration (horizontal, vertical, organizational) • Low horizontal ambidexterity penetration: o **Senior-management level**: partial focus on ambidexterity o **Middle-management level**: full focus on ambidexterity o **Employee level**: partial focus on ambidexterity • High vertical ambidexterity penetration due to the existence of an effective communication between the levels • Low organizational ambidexterity penetration due to the existence of a hierarchical organizational structure and low environmental dynamism
Macro-level of analysis: industry	The international organization uses the **Defender** strategy • The key strategy is to achieve the best product with the available funding. The balancing of cost, schedule, and performance/technical compliance are the primary goals of the business units. • Low dynamism of the environment: high barriers of entry and few competitors

	• The ambidexterity approaches that are promoted in the organization are the following: o **Contextual ambidexterity approach**: Simultaneous focus on both exploration and exploitation within projects from team members o **Structural ambidexterity approach**: Multiple teams work on the current projects, and one team works on the future project in different business units o **Punctuated equilibrium**: Matrix support teams work on current and then on future projects in the same business unit o **Reciprocal ambidexterity approach**: not applicable in the organization

7.3 Initiatives of ambidexterity and leadership in Business Unit D

Having thoroughly analyzed how top management teams manage ambidexterity in the international organization and how ambidexterity penetrates across multiple organizational levels, some initiatives as described by a project leader in Business Unit D are presented below, which take place in the above unit. These initiatives reveal how individuals initiate ambidexterity at multiple levels during a project management, how top management teams balance tensions between explorative and exploitative projects, and how explorative projects are in particular managed through a specific procedure that is called risk management.

7.3.1 Initiative X of a project management in the business unit

This section refers to initiative X, according to a description provided by a project leader in Business Unit D. This initiative reveals how individuals initiate ambidexterity at multiple levels during a project management.

The primary operations of the Business Unit D are related to the provision of project management services for the government defense organization. The majority of these projects concern the upgrade of capabilities of airborne (aerospace) assets that are used for defense purposes. Also, in several projects, the objective is the replacement of ageing equipment (called legacy systems), which faces serious obsolescence problems due to diminishing manufacturing sources of key components.

The major phases of a typical project are the following:

Definition of the requirements

The primary user of the airborne defense asset issues a Requirements Definition Document (RDD), which describes the required new capability or a serious obsolesce issue that endangers the future operational exploitation of a particular asset (airborne defense system). The user is not required and, in most cases, should not describe a technical solution, or specify a particular procurement source.

Analysis of the requirements and allocation of resources

Business Unit D forms a project team, which is composed of a project manager and a group of specialists dedicated to the particular project who will be assigned different aspects or requirements of the project, e.g. technical, logistics, and configuration control, among others. In addition, the business unit's higher management will assign certain part-time specialists to the project, called matrix support members, who will be assigned broader-type tasks, such as system engineering and integration, accounting, and contracting, among others.

The newly formed project team will analyze the operational requirements and propose implementation options along with the estimated cost, cost/benefit analysis, risk analysis for cost, implementation schedule, and actual operational performance. Business Units D's Board of Directors (BoD) will select the optimal implementation option based on the provision analysis, the project manager's recommendation, and the overall policy as well as available resources of the defense organization. Finally, the financial resources will be allocated to the unit in order to start the implementation of the project.

Start of project implementation

The project implementation will start with the contacting actions, which will depend on the selected implementation option (open competition or direct negotiation with a sole source or multiple sources/contractors). As a first step, the project team will produce the Statement of Work (SOW), which will become an integral part of the prospective contract and include all the responsibilities of the contractor(s) in terms of deliverables, such as equipment, documentation (manuals, drawings, etc.), and services (e.g. training, technical support, etc.). This phase will conclude with the contract signature and the beginning of the contractual period.

Project execution and communication

This is the main and most critical phase of the project. Two types of communication are in place for the support of the project co-ordination:

Internal communication: This is the communication between the members of the project team (including matrix support), which takes place regularly, twice a week (usually on Tuesday and Thursday mornings). The duration is one to one and a half hours, and, in most cases, team members that are on travel duty or non-collocated participate via teleconference. During these meetings, each member of the team briefs the group on the matters of his or her specialty, following a structured presentation in the form of PowerPoint slides. Each team member usually prepares a single slide of the presentation, which has the form of a quad-chart with the following elements: key issues, recent activity, watch items/critical issues, and short-term schedule. However, each team member may customize certain elements of the quad-chart to better fit his or

her tasking. There is also the program manager's slide, which includes the key issues concerning the project progress and a Microsoft project slide that contains the long-term project schedule, the key milestones, and the critical path. In each slide, the elements that have changed since the last meeting are usually marked in an alternate font color (usually blue or red). Each team member should update his or her slide before the end of the previous day and place it in the business unit's IT server.

External communication: This is the communication between the project management team of Business Unit D and their counterparts (per functional area) of the contractor: program management, contracting, finance, engineering, and configuration control, among others. These meetings are usually called Project Management Meetings (PMM) and are held weekly. As the contactor and the business unit are not co-located, these meetings take place via teleconference at hours that are convenient for both parties, taking into account the different time zones. Like the internal meetings, these meetings are structured and are based on a PowerPoint template where each team prepares one or more slides. The slides are prepared by the contractor's team members who are informing their Business Unit D counterparts on their progress on the execution of the project. In some cases, instead of PowerPoint presentation (which is pre-distributed the previous day), real-time presentations are used via the WebEx platform. However, quarterly, a Progress Management Review (PMR) face-to-face meeting is held at the contractor's premises, which is actually a day long much more detailed version of the weekly PMM with broader participation.

Project closure

The project is considered completed when the contractor provides Evidence of Compliance (EoC) for all the contractual requirements. The evidence may be in the form of test reports that prove the performance of particular equipment, certificates of compliance (CoC), or documentation in hardcopy or electronic format. All the deliverables must be approved by the respective specialists of Business Unit D and are usually provided by the contractor incrementally during the contractual period.

Accountability of the project team and possible tensions

During the execution of each project, the respective Business Unit D Program Manager is required to report on a weekly basis to the unit's General Manager the progress of the project along with any issues or risks that may affect the cost, schedule, or performance and the availability of resources (mainly financial) to deliver the project successfully and on time. The General Manager has to report on a bi-annual basis to the BoD an executive-level report where (s)he informs the board on the status of each project and reports any problems that may cause schedule delays or cost overruns.

Areas of possible tensions are the following:

- The communication between the project experts of the project team and the Project Manager.
- The communication between the Project Manager and the General Manager.
- The communication between the General Manager and the Board of Directors.

The tensions arise in the cases when the higher-level party attempts to micro-manage issues that the lower-level party believes is within its authority to make decisions and interprets the higher-level intervention as a sign of mistrust to its abilities.

A second case of tension is when the higher-level party believes that the regular briefings that it receives from the lower level are either too detailed and cluttered with details, missing to point the attention to the key issues or, at the other extreme, are too general and are missing information that are critical for making executive-level decisions.

However, in most of the cases, the tensions are temporary and are resolved within the established bilateral communication channels and do not require elevation to higher levels of management. In the majority of the cases, the tensions are a byproduct of schedule delays, and it is rarely because of cost overruns or performance issues. Figure 7.4 shows in detail the concrete steps of a project management in the Business Unit D.

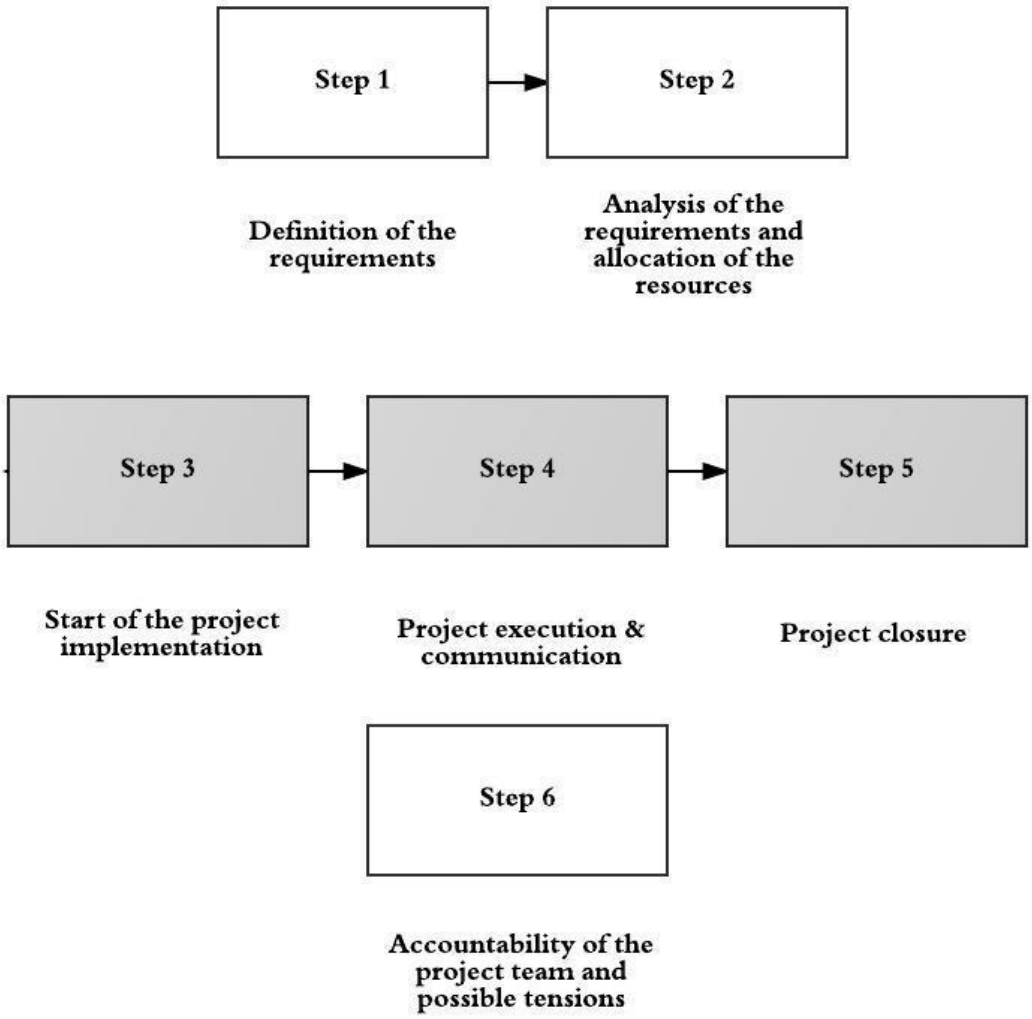


Figure 7.4: Steps of a project management in Business Unit D

7.3.2 Initiative Y of ambidextrous leadership in the business unit

This section refers to initiative Y of ambidextrous leadership, according to a description provided by a project leader in Business Unit D. This initiative reveals how top management teams balance tensions between explorative and exploitative projects.

Uncovering of the ambidextrous leadership requirement

The business unit's (BU) main tasking is to provide program management services to the international organization. In the majority of the cases, the programs that are selected for execution are of high importance as they are relevant to security of the nations that are participating in the organization, where all the participants collectively fund these programs, however not equally. The participation share of each member nation mainly depends on the financial capacity and its strategic interests in the field of business (i.e. security) that is collectively perused via the organization.

The fact that the programs are related to security, an issue of key importance in the modern world, and that these programs must deliver successful results within finite and strict time schedules add further responsibility to the BU's leadership. The BU's leadership is accountable for the timely and within budget execution of the program to its board of directors, which is composed of representatives of all the participating nations.

To add to the complexity of the program management of these complex security-related programs, the participating nations expect that companies within each individual nation will receive contacts related to parts of the work, which is related to the program under execution. In that respect, the main financial contributor expects that its national companies will be contracted to execute the largest part of the work and receive back the largest amount in the form of industrial returns. In the same sense, all the participating nations have the expectation that their national companies will receive a percentage of

the program's work (as industrial return) similar to the percentage of their participation to the program under execution.

The BU management is responsible, on the one hand, for executing the program by achieving all the cost, schedule, and performance targets and, on the other hand, for balancing the participation of the industries of all participating (and financially contributing) nations at predefined percentages. The above situation can include exploration and exploitation tensions that require ambidextrous leadership skills for the BU's management: There can be cases that the best performing and most cost-effective solution must be excluded because its execution does not fit the required industrial return profile that is imposed as a hard constraint to the BU's management when it comes to the selection of contractors. In that sense, by applying ambidextrous leadership skills, the BU's management must balance the distribution of the work at proper percentages, while maintaining high standards for the delivered product and keeping the predefined budget limits.

The main objective of the BU is to minimize the cost of the programs that it is managing, so that they fit within the affordability ceiling of the contributing nations. Exceedance of the cost limits would as much harm the confidence of the nations in the BU's management capabilities as would the delivery of underperforming products. As the program management services is the only function of the particular BU of the international organization, any doubts about the capacity of the BU to fulfill its duties may well mean its abolishment at the next restructuring of the international organization and the transfer of its responsibilities to another, better-performing BU. Therefore, the

management of the BU has every interest to excel at the performance of its duties in order to ensure the continuation of its existence.

Considering the above hard requirement for excellence that is imposed to the BU's management, the additionally imposed constraint regarding the selection of the contractors in accordance to the required Industrial Return scheme complicates the task of the program management and thus makes the need for ambidextrous leadership skills imperative. Although the concept of ambidextrous leadership has been traditionally linked with private companies who function within a highly competitive environment, this research has revealed that ambidextrous leadership is also required in governmental organizations despite the fact that they do not face any direct competition and are not profit oriented. This result of this study in government organizations initially came as a surprise, because this type of organization was considered as the least probable candidate for the need of ambidextrous leadership skills. However, the recent, worldwide economic crisis has affected not only the function of the companies in competitive business but also the mindset of the governments and governmental institutions and organizations: The paramount requirement to reduce the public expenses, but without affecting key public services like healthcare and security, is to impose the need for ambidextrous management to public sector, thus creating the need for ambidextrous leadership.

Application of the ambidextrous leadership

Refocusing to the particular BU that has been examined as part of this study, the ambidextrous leaders have to engage in the exploration of innovative management

schemes that will keep the contributing nations happy by providing their respective industries with fair contracts, while at the same time, the same industries shall be selected under strict criteria of quality and cost. It is not uncommon, for certain projects, that industries of a particular high-contributor nation are unable to deliver the required services or products, either within the required schedule or the available funds. In such cases, the BU management needs to devise innovative schemes, which however should not contradict with the legal aspects of international contacting, in order to satisfy both requirements: quality products and services within schedule and fair distribution of contracts among the contributing nations industries. Such schemes, for example, may be the following:

- Transfer of the industrial return benefits from project to project within the same overarching program. In this sense, the lack of a suitable candidate industry to receive contracts for a particular type of products or services is balanced by providing equal value contracts to other industries of the same nation but at another project, where they can deliver within the required quality standards, schedule, and budget. In the majority of the cases, the contributing nations do not have objections to agree to such arrangements as long as the right proportion of project funds are directed to elements of national industry with orientation towards development of new innovative technologies and increase of employment by increase of the number of labor workers.

- Transfer of industrial return benefits between the participating countries. It is a scheme where industries of a particular nation are awarded contracts that exceed the percentage of financial contribution of the particular nation to the international organization's budget. However, the BU's management selects to deviate from the rule due to the fact that the particular suppliers are offering superior products and/or services at lower cost and within the usually tight time constraints for the implementation of the program. This scheme also foresees a scheme where the industries that received the contacting surplus are obliged to offer work, in the form of subcontracting, to industries of the nations that received contracting deficit, i.e., contracts of value less than their contribution to the international organization. This subcontracting may be directly linked to products or services for the particular program under implementation (if possible) or for other contracts that are totally unrelated to the program managed by the BU. In either case, once the member nations manage to receive for their industries contract value proportional to their financial contribution, they will not object to the BU's management decisions that are oriented towards best cost, schedule, and product performance.

- Apply "political" pressure to particular industries, which are able to provide products required for particular programs, however not within schedule. The "pressure" can be enforced via the international organization's national representatives, who have interest that key industries of their nation become suppliers for prominent programs of the international organization, especially in the prestigious field of security.

It is evident that by applying proper ambidextrous leadership, the BU's management can balance on a thin line between interests of the nations and the execution of successful programs for the international organization.

Types of ambidextrous leaders at the business unit

There are different types of ambidextrous leaders at the BUs of the international organization, which can be categorized according to the degree of ambidexterity that they incorporate in their methods and processes. Each leader is defined by the particular personality and mindset that (s)he possesses, as well as by the challenges that (s)he has to face in the line of duty as a program manager. A simple and unchallenging program, with adequate funding and relaxed schedule, does not provide its leadership the opportunities to apply any of the ambidextrous management skills that they may possess. It is because there is actually no need to do so, in order to perform up to the international organization's standards. On the other hand, a challenging program where its complexity requires procurement of equipment and services from a large number of contractors, which has to be implemented within strict timelines and within the limits of a slim budget, stretches the management's abilities to their limits.

The leader (program manager) of a challenging program would need to employ a considerable degree of ambidexterity at all the decisions as (s)he will be required to deliver a successful program without violating the constraints imposed by the funding partners, with regards to the distribution of the funding to the contractors. Although, the manager has the option to seek the advice of impartial third parties, acting as

consultants, the ultimate responsibility for all actions will eventually fall upon his/her shoulders.

The leader's approach for the solution of emerging problems may involve limited or no ambidexterity principles, as (s)he may choose to follow the mainstream and tested practices. This approach may not always lead to the best possible or cheapest product, but it will ensure the avoidance of possible controversies between the funding partners or contributing nations. Alternatively, the leader may also choose to take risks and follow untested and unconventional methods and practices with ultimate aim to enhance the quality of the product (equipment or services), shrink the delivery times, and reduce the overall cost, however at the expense of the contracting constraints imposed by the established funding distribution schemes. In this latter case, (s)he will have to struggle with innovative solutions for the satisfaction of the industrial return requirements for each nation by using alternative methods of indirect industrials offsets, which can only be realized via rigorous justification of the involved parties. However, if no practical solution can be found, (s)he should be ready to support the management decisions in front of the board of directors and persuade the board for the validity of the choices regarding any policy deviation. That would be an ambidextrous approach, which – like in the world of business – encompasses substantial risk as a possible rejection of the leader's actions, as it could cause substantial delay or cost overruns that would reflect negatively both upon the BUs leadership and the BU in general.

Considering the above argument, it is evident that ambidextrous leadership is not exclusively found in the world of international business where the fierce competition,

especially in the hi-tech sector, is driving managers to embrace the ambidextrous leader management style in order to gain a competitive advantage for their company. In the public sector, especially at international, intergovernmental organizations, where the existence of ambidextrous leadership was thought unlikely to exist due to the absence of any competition, this study's findings have shown the existence of ambidextrous leaders. The difference between the classic ambidextrous entrepreneur at a private company and an ambidextrous manager at a public organization is dictated by the difference of challenges that they face. In the first case, it is the competition from adversary companies that operate in the same field, while in the latter case, in the absence of competition, the challenges arise from the rigid and, in some cases, extremely cumbersome constraints that are imposed by the public-sector regulations, rules, and guidelines that are usually dictated by legislation. Being backed by legislation, the constraints that an ambidextrous leader has to overcome at the public sector become automatically a high-risk roadblock as (s)he may face legal prosecution if the followed policies overstep into the "gray" area of possible illegality. As such events may have considerable consequences to the leader's career and beyond, the use of ambidextrous management needs to be very considerate and always backed by careful preparation and contingencies planning for the event that the situation does not evolve as originally assumed.

7.3.3 Initiative Z of an explorative project and risk management in the business unit

This section refers to initiative Z according to a description provided by a project leader in Business Unit D. This initiative reveals how explorative projects in particular are managed through a specific procedure called risk management.

Role of risk management at the international organization

Despite the large number of research output on ambidexterity, there are still gaps in our understanding about how senior executives manage explorative and exploitative projects in ambidextrous organizations (Halevi et al., 2015; Knight & Paroutis, 2017b). A more static approach proposes differentiation and integration mechanisms between explorative and exploitative businesses. Differentiation includes the isolation of one of the two businesses, to focus on a preferred innovative procedure, with no coordination between the two subunits, while integration includes the unity of efforts regarding explorative activites among different subsystems in the organization (Andriopoulos & Lewis, 2009). Still, in such cases of differentiation or integration, top managers experience difficulties in managing explorative projects in established firms due to their size (Levitt & March, 1988).

Recently, in the field of enterprise risk management (ERM), researchers have inserted the theoretical lens of ambidexterity as a dynamic capability. More specifically, ERM is a widely studied management control process, representing an important advancement from the traditional methods where the firms must control the risk that they face. Contrarily, the ambidexterity approach in ERM deals with the simultaneous engagement

in mitigating the existing and emerging risks, while pursuing value contributions in organizations from risk-management processes (Lauria, 2015). In the section that follows, a more detailed description of an explorative project and risk management in Business Unit D is discussed.

Risk management cycle

The BU of the international organization under study is providing program management services for the procurement of equipment and services required for security and defense purposes. As the security requirements are emanating from the present fluid international situation and are heavily influenced by politics, these requirements are almost exclusively urgent and have to be implemented within strict time constraints and within defined budget. Almost always, any schedule slip entails additional incurred costs, and thus the timely execution of the programs is the main concern of the BUs management team.

Keeping the time schedules for the delivery of security capabilities is not an easy task, because most of the deliverables are sources from a variety of contractors, which - despite the rigorous selection process based on their reliability - are frequently responsible for late deliveries. Considering the complexity of the projects and the large number of involved contractors, it is very common for a single deliverable to be on the schedule's critical path, resulting to program freeze until its delivery.

Therefore, the BUs management team is obliged to constantly calculate risk for every decision that will almost certainly be expected to affect the program's execution

schedule and calculate the potential financial impacts of delays. This is a continuous effort that is executed in the form of risk management, which is becoming an integral part of the program management processes. The risk management cycle is composed of three phases:

- The risk estimation that takes place during the program definition phase based on all available information before the start of the program and is based on the following:
    - Rigorous risk analysis of potential inhibiting factors; and
    - Risk reduction activities that may go beyond theoretical analysis to include experimentation and/or prototype building and evaluation.
- The risk mitigation strategies and actions that are prepared to ensure that in the case that the threats are realized, their impact will be minimized via counter measures or backup plans.
- The risk re-evaluation is the continuous estimation of the risk during the execution of the program, which takes into account the program execution progress, the effect of the threats that are responsible for schedule delays, and the effectiveness of the risk mitigation plans. Finally, at this phase, it is still possible to introduce new risk mitigation measures if it is deemed that the originally employed ones are not effective.

The majority of the complex programs are reviewed during their execution, and it is not uncommon for their scope to be extended. The extension of the scope introduces the requirements for additional deliverables that would have to fit within the execution

period, which is usually a tight time schedule. Such cases dictate the review of the original risk analysis, identification of new risks, and incorporation of new mitigation measures into the program execution plan.

Value of risk management assistance to ambidextrous management

The risk of each program, particularly the schedule risk, is linked to the management style of the BU's management. A short and aggressive execution schedule means early delivery of a new capability to the stakeholders and provision of a new asset for the security responsibilities of the international organization, as well as cost savings that reflect positively to the international community and therefore to the reputation of the organization. On the other hand, an aggressive execution schedule will entail increased risks for potential delays that may even endanger the success of the program, should the involved security capability be delivered much later than the needed timeframe. At this point, the employment of ambidextrous management techniques, which contain the right mixture of conservative and aggressive planning at certain phases of the program execution, can provide the optimal result. The main tool for the selection of the proper approach at each phase is the continuous application of risk management techniques that would identify the risks as early as possible and mitigate them via carefully planned measures.

Ambidextrous management is inherently linked with risk, as the exploration component of ambidexterity is dictating the adoption of innovative solutions, which have been untested and thus entail considerable risk. An ambidextrous leader who is more inclined towards exploration is expected to take risks by testing new methods and new

approaches against the challenges. Doing so, it is sensible to reinforce his or her resolution for disruptive change with a rigorous risk management plan. That approach will provide an estimation of the risks, obvious and hidden, and allow the planning for risk mitigation strategies. Therefore, risk management can be considered as the ultimate tool of ambidextrous leaders that allows them to plan carefully their steps towards the transformation of their business.

At the international organization, where the key requirement for the management of the BU under study is the timely, within schedule delivery of defense and security capabilities, risk management is an indispensable tool for decision making, both at the planning phase of the program definition and during the execution of the program, following the above described risk management cycle. The *a priori* knowledge of the risks that are embedded into the key management decision makes it possible to select innovative solutions that are untested and usually not preferred in the field of security, which opts for more traditional and well-established courses of action. Therefore, risk management is the main management tool that makes it possible to introduce ambidextrous management practices at an organization, which has traditionally been known for its dedication to mainstream management style, oriented towards exploitation of the resources of the member nations.

Application of risk assessments for strategic decisions

In practice, the program definition phase is the time when the decisions regarding the type of the procured equipment and services are made. A possible decision to include an innovative component in the procurement program, which has either not been

adequately tested, or is doubtful to be available on time (because at the time of program definition, it was still under test or even still under development), may introduce a considerable risk for the execution of the program within the predefined schedule. However, the inclusion of innovative components, if they indeed perform up to expectations, will improve dramatically the performance of the system and play a major role for the eventual success of the program. On the other hand, if certain innovative components prove to be totally unsuccessful, or are not made available within the program schedule, then if proper risk management has been in place, the risk mitigation strategy would have foreseen alternative solutions that will soften the impacts to the program schedule milestones.

Similarly, in the program definition phase, during the program execution, the management of the BU is constantly facing challenges emanating from unexpected events most commonly related to the contractors and subcontractors' performance. Therefore, the BU's management is constantly required to make decisions that impact the execution schedule. At this execution phase, the employment of risk analysis efforts before each decision allows the management to make educated choices, and even then, it may opt for unconventional choices, should the risk analysis show that the risk is manageable and a robust mitigation strategy can be in place.

Risk assessment methods and practices

Risk assessment is the process where the potential risks that threaten the execution of a program are evaluated. For the majority of the programs that the particular BU of the international organization is involved as program management agency, the areas of

concerns upon which risk assessment is performed are cost, schedule, and performance. As it has been highlighted above, the most important area is considered to be the schedule because delays are always linked to additional costs as the international organization has high fixed operational costs due to the nature of its activities at the security services sector. Moreover, potential program execution delays are reflecting negatively to the reputation of the BU within the international organization, because the majority of the programs under execution have a high degree of urgency. Finally, attempts to accelerate the execution of programs, which are facing delays for various reasons, may lead to decisions that might compromise the final performance of the program's deliverables: the performance of the equipment or the quality of the services.

In the majority of the cases, the risk reduction is performed by the method of analysis: specialists evaluate the cost, schedule, and performance threats during the program definition phase and identify the risks in each area. Each risk is evaluated for two properties: the probability of occurrence and the impact of the consequences (magnitude/severity). The probability ranges from rare to assured while the severity from unimportant/negligible to catastrophic. The final assessment for each risk is a combination of probability and severity and is depicted on the 5X5 risk assessment matrix as shown in Figure 7.5 below. The resultant risk, based on the probability and severity assessments, ranges from low to excessive, with moderate and elevated areas in between. These risk areas are depicted on the risk assessment matrix in different colors: Dark Grey - low, Grey - moderate, White - elevated/high, and Black - excessive.

PROBABILITY	MAGNITUDE				
	Unimportant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Assured)					
B (Expected)					
C (Possible)					
D (Improbable)					
E (Rare)					

Risk management chart

Black: Excessive risk - unacceptable: major chaos almost certain. Special and immediate attention necessary; create immediate mitigation plan.

White: Elevated risk - major trouble expected. Exceptional attention will almost certainly be required; have mitigation plan ready.

Grey: Moderate risk - some disruption possible and attention is required.

Dark Grey: Low risk - minimal impact on business continuity; monitor to ensure low risk level.

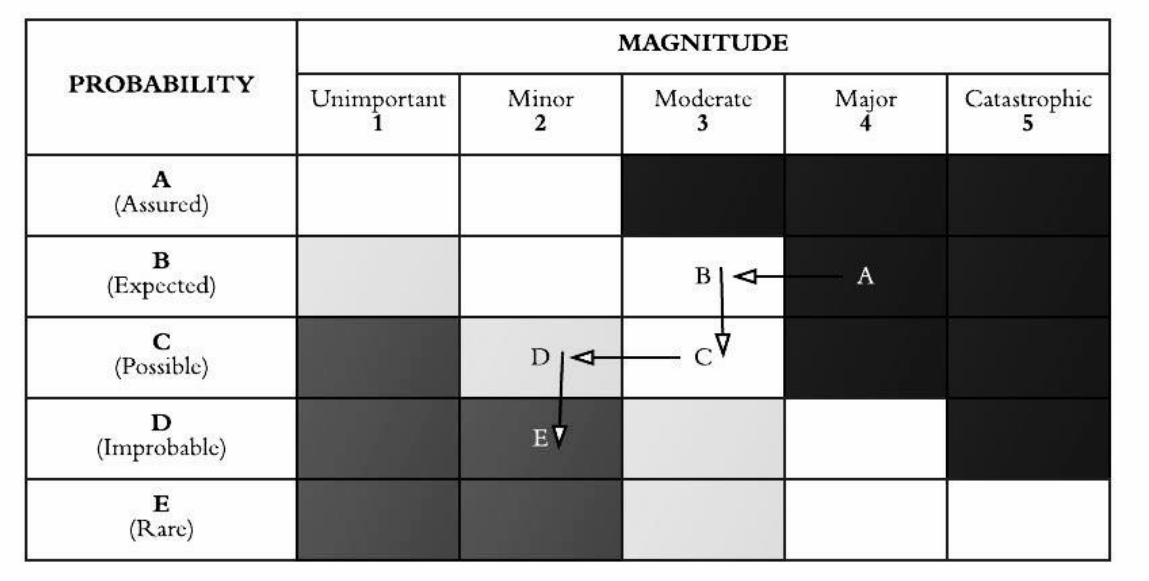
Figure 7.5: A typical risk assessment matrix is used in the organization as stated by project leader in Business Unit D

Risk mitigation methods and practices

The risk assessment would have been a pointless effort, unless it is complemented with a respective risk mitigation strategy for all the risks that have been categorized under risk areas, such as moderate, elevated, and excessive. The risk mitigation plan that is usually compiled by the same group of experts that perform the risk analysis is proposed to the program management leadership of the BU. Depending on the complexity and the prerequisites of the proposal, the program managers may accept the plan and incorporate

it into their strategy or may reject it and accept the risk without mitigation. The latter option is usually followed in cases of moderate risks.

If a risk mitigation plan contains distinct steps that reduce the level of each risk, it is accepted and put in place for a certain identified risk, and becomes the core of the risk management strategy. Ideally, all initial risks above the lowest level shall be reduced to low, but in certain cases, the program managers can accept moderate risk level. A risk mitigation plan can be depicted on the 5X5 risk assessment matrix as shown at Figure 7.6 below:



Mitigation Step	Initial Risk State	Risk Mitigation Measures	End Risk State
1	A -Excessive (4B)	Actions XYZ -1	B- Elevated (3B)
2	B- Elevated (3B)	Actions XYZ -2	C- Elevated (3C)
3	C- Elevated (3C)	Actions XYZ -3	D- Moderate (2C)
4	D- Moderate (2C)	Actions XYZ -4	E- Low (2D)

Figure 7.6: Risk mitigation plan

The existence of risk mitigation plans for all the program risks (at least the ones above the moderate level) allow the BU managers to adopt more aggressive solutions knowing that in the case of failure, there is a back-up plan that will soften the negative effects. On the other hand, if the bold decisions pay off, that would mean considerable gains in terms of early delivery of the capabilities (schedule gains) and reduced expenses (cost gains).

A common example that illustrates the risk management approach in aerospace and defense applications is the decision to use commercial grade components (usually called Commercial Off The Self - COTS) instead of military grade ones in order to reduce the cost of a military system. The key difference of the COTS components is that they usually lack the harsh environment operation certification that all military standard components have. However, if the probability for a particular component to be used in a harsh environment (e.g. polar or desert areas) is very low and if the consequence of its failure is minimal to the overall system reliability and operation (e.g. due to multiple redundancy system design), then the risk analysis may result to a low risk verdict that will allow the use of lower cost COTS components in place of high cost military grade ones. This application of risk management is usually employed to reduce program costs and in several cases to accelerate program execution (schedule gain), as COTS components are usually readily available while military ones have long delivery delays.

As it has been pointed out, the application of risk management techniques is not restricted to the program definition phase and is extended during its whole duration. As unexpected events are emerging during the program execution, the BU managers are

obliged to respond with solutions. The involvement of risk management strategies can allow them to take high-risk decisions that can face the execution problems with minimum cost and schedule slip. Therefore, risk management becomes a key ambidextrous management tool during the program execution phase as well. In both program definition phases and execution, the existence of risk mitigation plans provides the managers the confidence to explore novel and untested solutions for the problems and challenges, which are finally capitalized as cost savings for the international organization.

Conclusions: risk management practices enable ambidextrous management at the international organization

Even though ambidextrous management and ambidextrous leaders are usually associated with the competitive world of businesses, this study has revealed that ambidextrous management practices are present at the government or public sector as well. In this case, it was revealed that at an international governmental organization, BU management under study applied ambidextrous management techniques in its efforts to maintain the program execution schedule and reduce the implementation cost. The key tool that allowed the managers to apply explorative solutions has been the concurrently used risk management techniques that help them identify the potential cost, schedule, and performance risks at all phases of the project: at the beginning, during the program definition, and during the execution. The risk mitigation plans, which are produced as a part of the risk management process allow them to have the confidence to deviate from the typical public-sector management style, which is commonly associated with traditional cumbersome practices, dedication to established procedures, and limited

flexibility. Therefore, they can explore innovative solutions, adopt flexible and adaptable solutions that can produce short and long-term gains in terms of shorter delays and higher cost savings, and in the event of failure, the already in place risk mitigation plans would contain alternative actions that would drastically reduce the consequences in the program's cost and schedule.

7.4 Summary

In summary, in this chapter, the interview findings retrieved from participant questionnaires in the international organization are described in detail. First, the chapter introduces the analysis of findings that takes place on the micro-level of the organization regarding ambidextrous leadership. Then, it continues with a meso-level of analysis that deals with ambidexterity penetration across levels, and finally it presents a macro-level analysis of findings regarding ambidexterity approaches found in the organization under study. The chapter concludes with some representative initiatives that take place in the Business Unit D for a more comprehensive understanding of ambidexterity and leadership in the organization.

More specifically, the micro-level of analysis findings retrieved from participant questionnaires in the international organization are classified into first-order concepts, and then into aggregate dimensions. In that regard, they show that leaders in the international organization occupy the role of ambidextrous managers, who use mostly transactional leadership style. Due to highly centralized organizational structure, with many organizational levels and a low dynamism external environment, they mostly focus on the clarification of goals, coordination, and direction. In addition, they provide

guidance and intervene, when necessary, into the project management. On the other hand, they also use some form of transformational leadership style, where they motivate their employees, concentrate on good communication with all the parties involved, and focus on the individualized consideration of these employees.

At the meso-level of analysis, findings show how ambidexterity penetrates at the multiple organizational levels in the international organization. More specifically, it is observed that there is a low horizontal ambidexterity penetration in the organization, both at the senior and employee levels. There is a high vertical ambidexterity penetration due to the alignment of the decision-making procedures between levels and good communication skills of employees. Finally, there is low organizational penetration in the international organization due to highly centralized organizational structure and low environmental dynamism of the industry. Overall, the organization presents a low ambidexterity penetration at multiple levels of management.

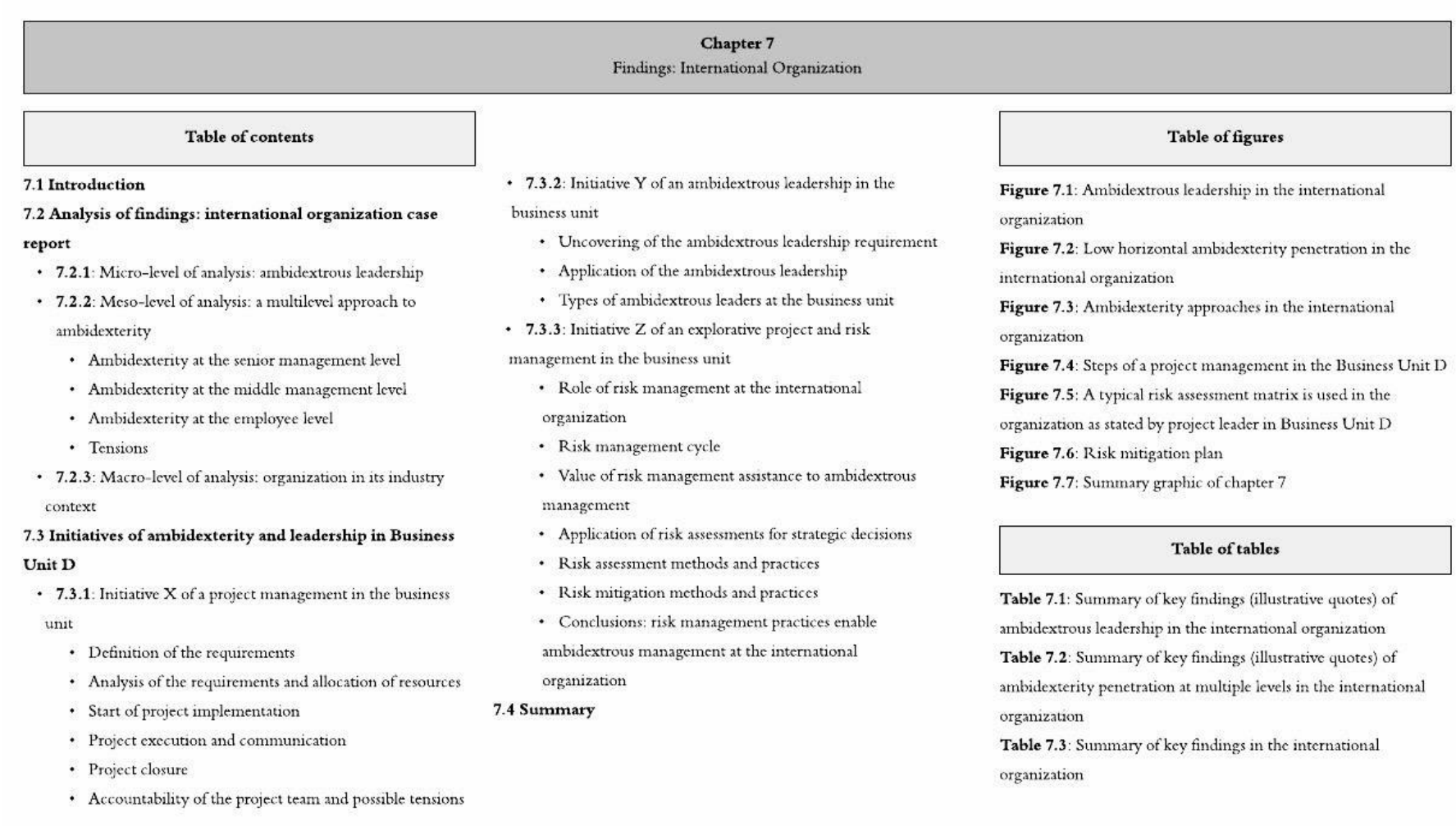
At the macro-level analysis, findings show that the international organization uses the Defender strategy. Here, the key strategy is to achieve the best product with the available funding, where the balancing of cost, schedule, and performance or technical compliance are also the primary goals of the business units. There are three out of four ambidexterity approaches that are promoted in the organization, which are contextual and structural approaches, as well as punctuated equilibrium. Reciprocal ambidexterity approach is not applicable in this organization.

The chapter concludes with some representative initiatives of ambidexterity and leadership observed in the Business Unit D. Having thoroughly analyzed how top management teams manage ambidexterity in the international organization and how ambidexterity penetrates across multiple organizational levels, the chapter presents initiatives of project management in the business unit. These initiatives reveal how individuals initiate ambidexterity at multiple levels during a project management, how top management teams balance tensions between explorative and exploitative projects, and how explorative projects in particular are managed through a specific procedure called risk management.

Contrary to the common belief by scholars that ambidextrous leadership is essential only in the dynamic and competitive environment of the private businesses, this study has revealed that ambidextrous leadership does exist in the government organization under study, though facing different types of challenges. In many cases, ambidextrous managers have to navigate through a maze of public bureaucracy, conflicting laws and regulations, and inflexible processes in order to deliver their work on time and within budget. Being in the sensitive field of security, shortfalls are usually not forgiven. The recently developed tools of risk management have proven to be a valuable tool for their work, as it has become a systematic process that can help them foresee the potential dangers and select alternative strategies in time. The structure of this chapter is graphically illustrated in Figure 7.7.

In the following chapter, the study focuses on interview findings retrieved from participant questionnaires in the three private aerospace and defense (A&D) companies.

The chapter introduces the analysis of findings that takes place on the micro-level of these companies regarding ambidextrous leadership. Then, it continues with the meso-level analysis that deals with ambidexterity penetration across levels, and finally it presents a macro-level analysis of findings regarding ambidexterity approaches found in these companies. The chapter concludes with some initiatives that take place in the A&D companies under investigation.



Chapter 7
Findings: International Organization

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Figure 7.7: Summary graphic of chapter 7

CHAPTER 8

FINDINGS: AEROSPACE & DEFENSE COMPANIES

8.1 Introduction

This chapter analyzes interview findings retrieved from participant questionnaires and face-to-face interviews in the three private aerospace and defense (A&D) companies. These A&D companies require the type of leadership that drives the effective management of innovation and cost efficiency. The ambidexterity approach is selected as the most appropriate approach to study leadership and organizational ambidexterity in their organizational set up. The chapter concludes with some initiatives that take place in these A&D companies under study.

8.2 Analysis of findings: aerospace and defense companies case report

8.2.1 Micro-level of analysis: ambidextrous leadership

Leadership plays an important role for the promotion of ambidexterity among aerospace and defense companies. Senior executives use different sets of leadership behaviors in these companies, with good communication skills, motivation, inspiration, and honesty in interpersonal relationships with subordinates being perceived by most of the employees as the most important elements of leadership. At the same time, clear expectations, discipline, and a structured way of thinking are also needed to provide structure, to ensure task completion and goal attainment.

In that regard, the CEO in Company 2 described how he perceives his leadership behaviors should influence subordinates in his company as: “Lead by example, make people work hard but reward them generously, demand discipline but leave room for initiative”. The CEO in Company 1 has explained it as: “Openness, honesty, clear expectations are all that needed”. Finally, a project leader in Company 3 has also stated what kind of leadership behaviors he expects from his superior:

> A leader must have a structured way of thinking, he must understand deliverable requirements quickly, and finally he must know his people’s skills and also their expectations and special needs (Project leader, Company 3).

In addition, both transformational and transactional leadership are found to promote ambidexterity in the aerospace and defense companies. Transformational leadership is promoted through communication of high expectations and individualized consideration. Motivation is found less frequently but still constitutes an important factor. Transactional leadership, on the other hand, is promoted through clarification of goals and through intervention when necessary.

According to the findings of this research, the most important leadership behaviors presented in leaders in the aerospace and defense companies, with respect to contingency theory, overlap with frequently used transformational and transactional leadership characteristics, which in turn are linked to ambidextrous leadership theory. In addition, project leaders and employees have reported that according to their estimation, their leaders use most of their time on standardized or everyday activities, and less time on the planning of future activities. The above findings are in line with what was found in the international organization. A project leader in

Company 3 explained it as follows:

> Most of our time (80%) is dedicated to current/exploitative projects - I know, too much, to the frustration of many employees. At the same time, 20% of the time is used for the future/explorative projects. In the exploitative projects, we mostly think tactically in the short/mid term. Planning in the long-term is done as well but in a very pragmatic way and there is low commitment from the employees because these LT plans are not communicated in a consistent way (Project leader, Company 3).

Moreover, even though the large aerospace and defense companies 1 and 2 have a bureaucratic structure, while Company 3, which is smaller, has a less structured form of organization, managers in all of these companies are mainly oriented towards exploitative activities. It is noted that although certain explorative activities were regularly employed at Company 3, these could not be considered representative of the aerospace and defense industry sector under investigation, as this particular smaller size company represents the minority group at this business sector, which is dominated by large corporations. The above findings about the exploitative activities of the managers are in accordance with other scholars' work (Davis et al., 2009; Mathias, 2014; Raisch, 2008; Raisch & Hotz, 2010) who have found that exploitation of existing capabilities in centralized and hierarchical companies, that operate in low dynamism environments, impede innovation and flexibility required for exploring new capabilities.

Therefore, based on the above findings, leaders in the A&D companies occupy the role of ambidextrous managers, who focus their attention on current projects and on the execution of the everyday activities, while also using some of their time on future

projects and their long-term planning. Therefore, according to the above premise, in Figure 8.1 below, the ambidextrous leadership framework is briefly depicted in the private companies under investigation and some key findings (illustrative quotes) are summarized about ambidextrous leadership in the companies under investigation, in Table 8.1 that follows.

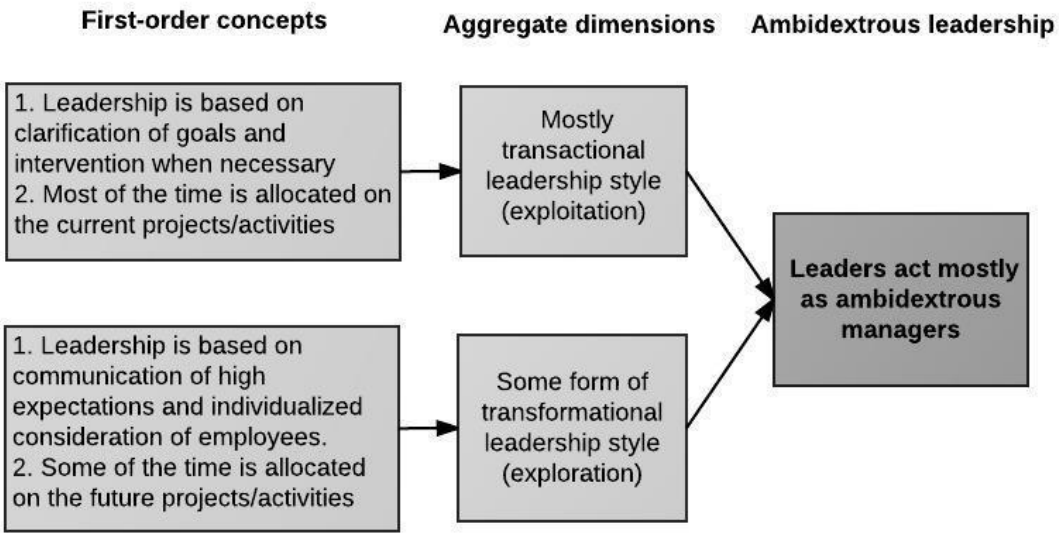

Figure 8.1: Ambidextrous leadership in the aerospace and defense companies

More specifically, this figure shows findings retrieved from participant questionnaires in the A&D companies, which are classified into first-order concepts and then into aggregate dimensions during the data analysis phase. In that regard, it demonstrates that ambidextrous managers in the A&D companies use mostly transactional leadership style, while due to highly centralized organizational structures with many organizational levels and a low dynamism external environment, they mostly focus on the clarification of goals. Most importantly, they intervene, when necessary, in project management. On the other hand, they also use some form of a transformational leadership style, where they communicate high

expectations to their employees and focus on the individualized considerations of these employees.

Table 8.1 below links illustrative quotes with contingency theory, which is comprised of two types of behaviors that have been found to be especially representative of effective leaders and which may comprise the basis of ambidextrous leadership: consideration leader behaviors, where leaders invest in good interpersonal relationship and show support and concern for subordinates and initiating structure leader behaviors, where leaders provide structure to ensure task completion and goal attainment. However, as it has already been mentioned in this study, existing contingency leadership approaches lack precision and action orientation. Therefore, in order to expand previous understandings and outline concrete leadership actions, in this research, it is proposed that ambidextrous leadership is related to two leadership styles, transformational and transactional leadership.

Table 8.1: Summary of key findings (illustrative quotes) of ambidextrous leadership in the aerospace and defense companies

Business Unit/Company	Level of management	Leadership type	Quotes
Company 1	CEO	Contingency theory	*Openness, honesty, clear expectations are all that needed.*
Company 1	CEO	Ambidextrous leadership (transformational leadership–exploration)	*I would say 40% of my time is invested in future planning.*
Company 1	Project leader	Ambidextrous leadership (transactional leadership–exploitation)	*70% of my superior's time is used in everyday activities.*
Company 2	CEO	Contingency theory	*Lead by example, make people work hard but reward them generously, demand discipline but leave room for initiative.*
Company 2	Higher manager	Contingency theory	*Managers and high-level employees are expected to work both strategically and tactically. Strategic is putting together a plan of what we want/where we are going. Tactically is implementing the plan and completing all day-to-day tasks and requirements.*
Company 2	Project leader	Ambidextrous leadership (transactional leadership–exploitation)	*40% is planned and 20% is unplanned, a total of 60% of his time is invested in everyday activities*
Company 3	Senior	Contingency theory	*It is very adverse for a leader to release control, but that is what he*

	executive		*should try to do. It is important to give people a sense of ownership in what they are doing; they have to feel as if they are working for their own. But if this does not motivate them, then you have to be on top of them, or else this person will spoil the team.*
Company 3	Senior manager	Contingency theory	*Listening skills, Being simple and thinking simple, being a role model so that others can listen you in a more open and constructive manner, patience etc.*
Company 3	Project leader	Contingency theory	*(1) The ability to really listen in order to understand people's thoughts and actions, and (2) coach people in order to make them think and reflect upon their actions and motives.*
Company 3	Project leader	Contingency theory	*A leader must have a structured way of thinking, he must understand deliverable requirements quickly, and finally he must know his people's skills and also their expectations and special needs.*
Company 3	Senior executive	Ambidextrous leadership (transformational leadership–exploration)	*Around 50% of my superior's time*
Company 3	Project leader	Ambidextrous leadership (transformational leadership–exploration)	*20% (mostly thinking tactical on the short / mid term; planning on the long term is done as well but in a very pragmatic way and there is low commitment from the employees because these LT plans are not communicated in a consistent way)*

The above table shows some of the illustrative quotes of participants about ambidextrous leadership in the A&D companies. It is divided into parts, while referring to leadership types that appear (a) in different companies and (b) at multiple levels of management in these companies under study. For example, both project leaders and senior executives refer to different behaviors that they observe in their superiors, which are in turn in accordance with some of the most important elements mentioned in the contingency theory. They also refer to transactional or exploitative leadership styles of their superiors, as well as transformational or explorative leadership styles in the companies under study. It is a fact that leads to the premise that there exists ambidextrous leadership in different business units and at multiple levels in all the companies under investigation.

8.2.2 Meso-level of analysis: a multilevel approach to ambidexterity

In the three A&D companies, the decision-making process involves layers of decisions in a top-down manner, usually without much input from below. Therefore, the higher management makes the decision, sets the strategic goals, the policy regarding pricing and costs, while lower management executes. However, in some units, even though the senior management decides, the decision-making is pushed to lower levels in the organization as much as possible. Therefore, senior management, after taking into consideration the middle-level management consultation, takes high-impact decisions. In that regard, exploration–exploitation tensions are managed at different levels, as they constitute a shared responsibility of all corporate members.

A project leader in Company 3 explained on this matter as: "Generally, the decision-making process is propelled through discussions. More specifically, the usual starting point is a brainstorming session, followed by analysis, followed by challenging of results. Consensus should be achieved in the end. Of course, most decisions are driven by experts' knowledge and the senior management's experience". Below, different managers in all the three companies express similar opinions on the decision-making process:

> The decision-making process depends on the weight and impact that each decision has to the organization. High impact decisions related to the strategic goals, pricing and costs are decided by the top management after taking into consideration the middle level management consultation (Senior level manager, Company 1).

> Decisions are taken by the CEO or the Technical Manager or jointly. Suggestions by middle management are always taken into account in the decision making process (CEO, Company 2).

> In the end, the senior manager decides, although he tries to push decision making to others in the organization. It doesn't work out well due to …to state it very simple… many employees show poor motivation due lack of "ownership" over their work. Senior management is frustrated because employees show little initiative… (Project leader, Company 3).

Three tensions appear to be highly important for the promotion of ambidexterity at the three levels in the organization: the senior management level, the middle management level and the employees.

Ambidexterity at the senior management level

Ambidexterity at the senior management level is comprised of one main goal, which includes stable revenues for the best possible performance, but not always with the lowest possible cost. Alignment at different levels is achieved in part through communication and clear messages. Formal meetings, depending on the company, can take place every week, every two weeks, or once a month. Informal meetings can take the form of ad-hoc meetings and can happen at any time, on a case-by-case basis. Within teams, the communication is usually informal; if the gap to higher levels (directors and higher) widens, the communication becomes more formal. In some cases, the communication in both directions (top management to employees and vice versa) takes only the form of newsletters, roadshows, and electronic media, such as intranet or e-mails. Project leaders in Companies 2 and 3 explained it as follows:

> Several formal meetings occur each week regularly - these provide a foundation of the communication paths. Myself, however, find these can only cover a portion of needed communication and prefer informal meeting - "management by walking around" style. It takes much longer, but it offers several key benefits; more input, employees valued, ideas that would never be shared in a group are now accessed, more personal time… (Project leader, Company 2).

> I have daily informal meetings both at the team level and with the senior management. Within our team of four engineers, two of us work very autonomously, while the other two need more guidance. Informal meetings are preferred. I try to evaluate our progress formally once a month. Senior management prefers to communicate with the team informally, something that occupies 70-80% of my daily communication agenda, something that I would prefer to be reduced. In my opinion (and that's something that I promoted both in my MCP and as a part of

> the improving internal information), there should exist at least one formal reporting from mid to senior management, say on a weekly basis. Instead, I do not have any formal reporting, that results in frustration at the senior management level and in wrong prioritization of tasks. Finally, downward instructions could be done in a much more consistent way (Project leader, Company 3).

Ambidexterity at the middle management level

Ambidexterity is fully found at the middle management level in these three companies. Project leaders seek to develop high-quality customer relationships, while delivering projects on time and within budget. There is not much room for improvisation, in terms of goal setting. However, they have the freedom to choose their own style in order to achieve their goals. In that regard, they are free to provide innovative work as long as they contribute to clients' value creation. A project leader in Company 3 stated it as, "For project leaders the short-term goal is to deliver their project. The long-term goal is to strengthen one's weak points and maintain the strong points. There is not much room for improvisation in terms of goal setting. There is, though, much freedom regarding the way one chooses to follow in order to achieve their goals". This is in line with what the CEO of Company 2 stated according to whom:

> Short-term goals are primarily to complete a job on time and within budget, while the long-term goal is to maintain the trust of the client and ensure the good relationship, which will make future projects easier to win. A lot of space is afforded to the people who are free to take initiative and improvise (CEO, Company 2).

Ambidexterity at the employee level

Ambidexterity is partially found at the lower level of employees. More specifically, employees face two interrelated challenges, which are discipline and creativity. On one hand, they are asked to develop current or future products in short time frames, with limited budget. On the other hand, creativity in teams is not considered to be of high priority.

More specifically, creativity is promoted, but employees feel that, most of the time, it is still the obligation of the senior management to create an environment to foster innovation, along with project managers who are responsible for the final decision. Deadlines are always considered for the prudent allocation of financial resources. Goals and deadlines are explicitly defined at the start of each project. Some employees work on their own, others consult, and if they do not come in agreement with other team members, they seek resolution with management. According to an executive manager in Company 3: "The employees are encouraged to own their work, so the discussions can be fierce. The CEO tends to win the discussion, which sometimes results in people trying to avoid discussions. For small things, this works, but for bigger issues, they know they have to pass via the door. It is an unwritten company philosophy which has grown, a way to act". This is in line with what a project leader in Company 2 stated:

> Generally speaking, employees work well with other functions, groups and team members - everything from formal meetings, gathering around a table by office area etc. Consensus usually drives the final decision or in cases where they do not feel comfortable or when management has asked for input, they will approach the leader and ask for the final determination (Project leader, Company 2).

Tensions

In everyday communication, tensions appear among team members and between employees and middle/senior management. Different problems arise when employees differently understand the objectives in assigned tasks, whereas, sometimes, the prioritization of tasks and responsibilities is unclear. Some of the employees also complain about problems of misunderstanding that arise in a long-distance communication. They believe that there is too much e-mail and not enough one-to-one communication, especially with organizations that are geographically dispersed. Finally, in many cases, they express the view that senior management does not dedicate enough time for communication.

The alignment of objectives and tasks is important from the senior management level to the individual level, and the higher the degree of alignment, the higher the effectiveness of organizations to operate ambidextrously. Below, a project leader in Company 3 discusses the existing problems in his company and how he wishes them to be resolved:

> To state it very simply: many employees show poor motivation due to lack of "ownership" over their work. Senior management is frustrated because employees show little initiative. Personally, I believe senior management must instill a clear vision of the company's strategies to employees through the following actions: (1) involve the pioneers within the organization into a facilitated strategy workshop(s) in order to "transfer ownership and vision" to them, (2) set up and coach a management team (by external expert/psychologist) in order to prepare them to pick up management tasks, (3) constantly inform employees on the vision, how we want to go there and simply on what goes on in the organization, and (4) assess the interests/talents of employees and have them trained formally in order to develop them (Project manager, Company 3).

Incentives and rewards

Incentives and rewards are important in order to align strategic-level objectives with project-level decisions. More specifically, if organizations want to promote innovation, certain rewards must be linked to employees' explorative activities and creative ideas. Otherwise, if there is no incentive system in place that rewards creative behavior, exploitation is preferred over exploration even in the most entrepreneurial projects. It is because exploitative projects have fast and predictable results, whereas explorative projects are risky and the expected returns take longer to materialize. In that regard, while in some of the companies under study, senior management promotes creative ideas by rewarding performance; in some others, there are no monetary rewards or any systems of that kind. The CEO in Company 3 explained it as follows:

> Each year, all employees are ranked on a list according to a combination of effort and skills for the company to reach success. This hierarchical list allows comparing different advantages in type of work, cost and wages to balance. Drastic changes are rare, temporary effects are smoothed out from year to year (CEO, Company 3).

In sum, when analyzing the above tensions from a multilevel perspective in companies under investigation, ambidexterity seems to exist at the senior management level. Still, neither cost efficiency (exploitation) nor innovation (exploration) constitute the top priority of senior management. Performance seems to be achieved in a less cost-efficient way. In addition, ambidexterity at the middle management level is fully achieved, as project leaders do not have enough space to deviate from goals, while creativity and improvisation are promoted well enough at the team level. Finally, ambidexterity is also partially found at the lower level of

employees. Projects are developed by individuals in short time frames with limited budget, while creativity is partially promoted. In Figure 8.2, a visual representation of the data structure and findings are presented, which show a low horizontal ambidexterity penetration across the levels in the A&D companies, and in Table 8.2, some of the most illustrative quotes are provided, which explain in more detail how ambidexterity penetrates across multiple organizational levels in the companies under investigation.

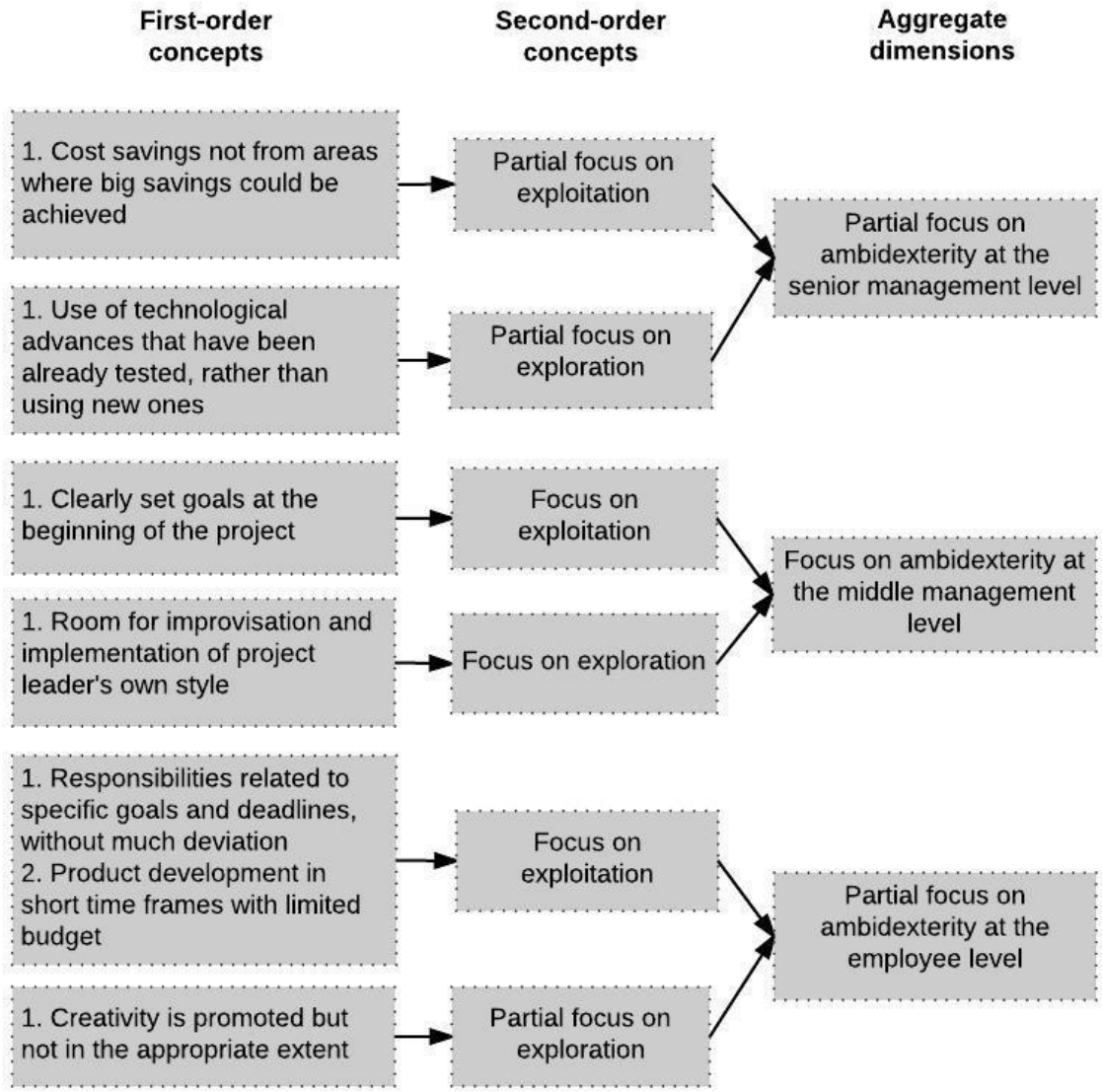

Figure 8.2: Low horizontal ambidexterity penetration in the three aerospace and defense companies

More specifically, this figure demonstrates how ambidexterity penetrates at the horizontal level in the three A&D companies and it shows that there is low horizontal ambidexterity penetration in these companies. In the first column, first-order concepts are presented that are based on the statements of the majority of the participants. Then, these concepts are classified into second-order concepts at each of the levels (senior, middle, and employee), and according to the theory, it becomes clear that there is only partial focus on the management of ambidexterity at the senior and employee levels, leading to the conclusion of a low ambidexterity penetration at these two levels, and thus low overall horizontal ambidexterity penetration in the A&D companies.

Table 8.2 below links illustrative quotes with ambidexterity penetration. As it has already been mentioned in this study, exploration–exploitation tensions are managed at the three organizational levels (senior, middle, and employee), something that is called horizontal ambidexterity penetration. More specifically, senior managers handle innovation and cost efficiency simultaneously at their level of analysis, middle managers handle innovation and goals achievement at the middle level, whereas employees manage their creativity and disciple in projects. Ambidexterity also penetrates vertically across all the three levels through organizational alignment, communication, and resolution of tensions of explorative-exploitative activities between individuals. Finally, ambidexterity can also penetrate throughout the whole organization, while taking into consideration organizational structure, strategy, and environmental dynamism.

Table 8.2: Summary of key findings (illustrative quotes) of ambidexterity penetration at multiple levels in the aerospace and defense companies

Horizontal ambidexterity penetration			
Levels of analysis	**Company**	**Job specification**	**Quotes**
Top management level	Company 3	CEO	*Goals are set with those that participate in the challenge. Scorecards are based on effort not results, as the challenge is often too high for a first result. Most challenges are reached in multiple steps and mixed teams.*
	Company 3	Senior manager	*It is very adverse for a leader to release control, but that is what he should try to do. It is important to give people a sense of ownership in what they are doing; they have to feel as if they are working for their own. But if this does not motivate them, then you have to be on top of them, or else this person will spoil the team.*
Middle management level	Company 3	Senior manger	*-Decisions are taken on what is better for the long term. This might result in turning a customer specification so that it becomes more universal for other customers.* *-The goal is a long-term drive to create or help create the best product. Separate goals are step-stones towards the big goal. The challenge of the project leaders is to find the middle in what the company wants and what the customer wants. And help the customer to choose where he*

			really cannot work with the offered solution, so help the customer to choose which battle to fight.
	Company 2	Program manager	*Short-term goals are not to make a mistake and long-term goals are to try to make money for the company. In general, almost everyone does try to keep the customer happy except occasionally senior management will do something that negatively impacts the customers. Some form of freedom is generally allowed and expected (i.e., continuous improvement or find a better way).*
Employee level	Company 2	Program manager	*Employees discuss their ideas with each other but management makes the decisions. Leadership does not generally promote creativity but leadership has no problem with flowing down individual employee responsibilities.*
	Company 2	Project leader	*Generally the employees work well with other functions and groups and team members - everything from formal meetings, gather around a table by office area, etc. Usually consensus drives final decision, or in cases where they do not feel comfortable or management has asked for input they will approach the leader and ask for final determination.*
Vertical ambidexterity penetration			
Top-middle	Company 1	Senior manager	*The employees are encouraged to own their work, so the discussions can be fierce. The CEO tends to win the discussion, which sometimes results in people trying to avoid discussions. For small things, this works, but for*

			bigger issues, they know they have to pass via the door. It is an unwritten company philosophy, which has grown, a way to act.
	Company 2	Project leader	*(1) Too much rhetoric driven by senior management, goals that do not align with everyday work goals; (2) Time - senior management does not always dedicate the time for communication.*
Middle-individual	Company 2	Program manager	*- Long distance communication between employees is a problem. E-mail is most often used to communicate over hundreds/thousands of miles and to people in different time zones. Short e-mails can lead to misunderstandings and hurt feelings and long e-mails tend to be avoided. -Senior managers rarely communicate with employees. The communication comes down through intermediate management (who are putting out the brush fires of the day) or through platitudes (like People First, Customer Always and management can blow these away at their discretion).*
	Company 2	Project leader	*(1) Too much email, not enough one-on-one, especially as organizations grow more geographically diverse; (2) not listening; (3) dogmatic tendencies which shut down communication paths.*
Organizational ambidexterity penetration			
Organizational structure	Company 3	Senior manager	*-The company is most efficient in the speed by which it can get things done and delivered. And less efficient in documentation during and certainly after development.*

			-Because we have been working a better radar-world so long, this goal has become a reflex. In every short-term decision we make, our build in nature drives us towards the long-term goal. I see an Ambidexterity in the long-term reflex (learned instinct), and the short-term conscious actions.
	Company 2	Program manager	*This is a large company with lots of bureaucracy. So speedy, cost efficiency and innovation are not really day-to-day objectives. The main objectives are not to do anything bad and try to satisfy the customers.*
	Company 2	Project leader	*Large companies, especially those with military products and large complicated commercial products that have grown over the years have a very bureaucratic structure - somewhat like the military itself. I think it certainly hampers the creativity of the employee, since many processes, and procedures are set up to keep the failures of the past from re-occurring. Younger do not deal well with the structure, they want growth and freedom now, older employees I think, have become more accustomed to the bureaucratic system, and in some ways are the cause itself.*
Environmental dynamism	Company 2	Program manager	*Low dynamism (few competitors, high barriers of entry)*

The above table shows some of the illustrative quotes of participants about ambidexterity penetration at multiple levels in the A&D companies. It is divided into three parts based on (a) horizontal penetration at the three levels (senior, middle, and employee), (b) vertical penetration between top-middle and middle-employee levels, and (c) organizational penetration in the companies, while taking into consideration organizational structure and environmental dynamism of the A&D industry. For example, both project leaders and employees refer to their main focus on exploitative activities in their business unit, where they use a well-established process for the involvement of all stakeholders in order to facilitate a well-informed decision-making. Next, middle-level managers and employees describe the difficulties and tensions in their communication with senior executives and other employees, and how they overcome any communication problems.

Finally, participants discuss how performance and cost efficiency are considered in every decision and they all note that they operate in a low dynamism industrial environment with high barriers of entry for any competitor, except for Company 3, where all the informants state that they operate in a medium to high dynamism industrial environment. However, due to the fact that the sample of interviews obtained in Company 3 is much smaller than the other companies, it was deemed appropriate not to generalize the particular results about the dynamism of the industrial environment to the whole sample of the aerospace and defense companies. In fact the interviews also uncovered that the particular Company 3 operations are mainly restricted to sub-contracting work for the major aerospace and defense companies and thus cannot represent the general trend of the sector in terms of dynamism. This study is mainly focused on the major players of the aerospace and

defense industry and thus most of the interviews were sought from their management and employees, however in a future research, it would have been of interest to investigate the case of these type of smaller-size but seemingly more dynamic companies, which support the major/international aerospace and defense companies by providing innovative high-tech components and software.

8.2.3 Macro-level of analysis: companies in their industry context

Finally, there is interdependence between organizational structure, strategy, organizational external environment, and ambidextrous leadership in the companies under study. Based on the above premise and according to Miles & Snow's (1978) adaptive cycle, Companies 1 and 2 belong to a particular structural configuration that is called the defender. Their external environment presents low to medium dynamism, while through highly centralized actions and managerial decision-making, these companies achieve to maintain a stable and predictable internal environment. They emphasize mainly on exploitation, and in order to achieve cost efficiency, their employees communicate through formal hierarchical channels at different organizational levels.

However, Company 3, belongs to a structural configuration that is called prospector. Company's external environment presents medium to high dynamism, while its primary aim is to find and explore new market and product opportunities. The company is less centralized and smaller in size than Company 1 and 2. It constantly develops and maintains a wide range of products by employing highly creative individuals and teams, while using multiple, novel technologies with a low degree of routinization and mechanization.

The short-term strategy of all the three companies is to successfully deliver every current project. Increasing competitiveness and promoting international outlook are also important. Their long-term strategy, on the other hand, is to invest in strategic partnership with customers that can support a healthy cash flow. This can be achieved by creating new, innovative products that will be promoted through new programs with existing or new customers.

Favorable performance metrics are of prime importance for these companies even at an increased cost, provided that there is alignment with the company's values and strategic vision. Short-term projects are kept within the minimum budget, while increased financial resources are allocated in new projects and R&D. In other words, performance, quality, and time are the main objectives met in parallel to reduce the cost. As a project leader in Company 1 explained: "The goal is to provide deliverables on cost, time, and quality". This is in line with what CEO in Company 2 mentioned:

> Our company is in the process of migrating from "performance at any cost" to "best possible result at minimum cost" in order to adjust to a difficult external environment (CEO, Company 2).

Moreover, ambidexterity is promoted in these companies through an appropriate incentives and rewards scheme that is based on employees' performance and on their innovative ideas. Regular, weekly feedback, 360 evaluations, and bonuses are extensively used to promote innovation. Proper incentives and rewards are the responsibility of the senior management and HR managers. However, most of the

employees complain that the promotion program or the bonus schemes are not fair enough. Project leaders in Company 2 and 3 explained it accordingly:

> Each function has specific description of various levels. It is a combined manager and functional that watches over a particular skill set that decide. The issue where senior management influences is in the area of affordability, and they would like the company to have less or at least balanced upper skill workers and entry level workers. So, this can perturb the promotion process (Project leader, Company 2).

> Senior management evaluates everyone once a year in order to try to bring relative logic in wages. As we have a very flat hierarchy, there is no real promotion. Last year, a pool of team leaders was selected to receive bonuses but this was done ad-hoc and without even speaking with the subject employees. There was also no function description, no clear responsibility, no screening. So, I think, this doesn't work (Project leader, Company 3).

The control system in companies under study is implemented starting from top management level and ending up to the middle management level. In most of the cases, employees and senior management perceive company goals, and the fairness of the reward system differently. For instance, in Company 3, the CEO explained how he believes planning, control, and reward in his company works in detail: "Each year, all employees are ranked on a list according to a combination of effort and skills for the company to reach success. This hierarchical list allows comparing different advantages in type of work, cost, and wages to balance. Drastic changes are rare, and temporary effects are smoothed out from year to year".

In general, despite the strict emphasis on goals achievement, these companies are considered to be less efficient than other companies in the communication among

individuals. Employees also believe that a less bureaucratic organizational structure would better promote ambidexterity. Controlling costs and being cost efficient is also difficult to achieve (i.e. they are less efficient than other companies in exploitative activities). On the other hand, in general, the companies are most efficient in the promotion of innovative ideas, a speedy accomplishment of goals and setting up a flexible decision-making process (i.e. they are most efficient in explorative activities). According to the CEO of Company 2: "Our company is very efficient at coming up with innovative ideas and in most cases accomplishes its goals on time. It is less efficient when it comes to controlling costs and sticking to budgets".

Finally, different organizational ambidexterity approaches are promoted in companies under investigation. In that respect, these companies exhibit a *contextual ambidexterity approach* with the simultaneous engagement of team members in exploration and exploitation in a single unit. For example, there are teams that work on both future and current projects as experts coming from other branches/sections of the same company (matrix support). In addition, these companies exhibit a *structural ambidexterity approach* with different exploitation and exploration units with emphasis on exploitation. For instance, multiple teams work on current projects and multiple teams work on future projects. A project leader in Company 2 puts it as follows:

> We have both areas where separate teams are set up for a future project and current, and other areas where the current project also handles the future project as growth to its current base. We are a very large company with hundreds of projects new and old. We span the globe with people and products (Project leader, Company 2).

Punctuated equilibrium is also used in teams that devote their time on current projects first and then on future projects. Current projects are usually allocated the largest time. If the project is large, then it is usually split and managed as two separate projects (current and future project) where resources and capital can be allocated appropriately. For example, a group of employees work on a current project for an upgrade of an aircraft, while other employees will be allocated to a future project to study possibilities for further improvements of systems of this aircraft. In Figure 8.3, three out of four ambidexterity approaches found in the A&D companies under investigation are briefly described.

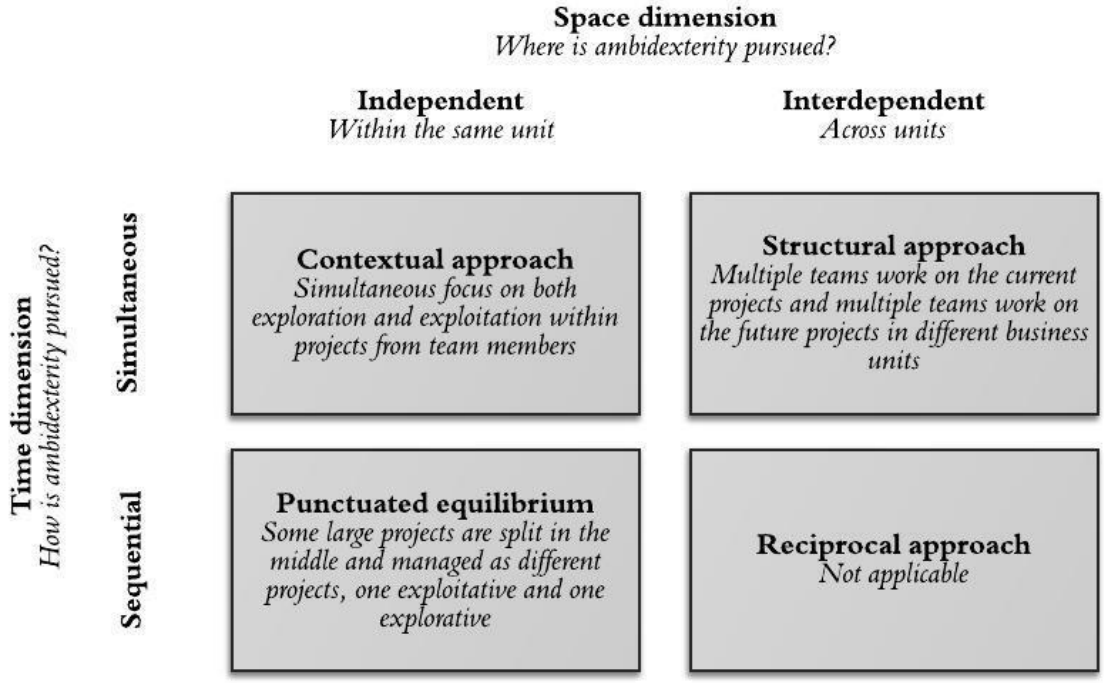

Figure 8.3: Ambidexterity approaches in the aerospace & defense companies

Birkinshaw & Gupta (2013) and Simon (1962) have argued that organizations are nearly decomposable systems, where parts of these systems communicate with each

other. Thus, effectively managed organizations must have some blend of exploration and exploitation at each level. Hill & Birkinshaw (2014) have also stated that all the ambidexterity approaches are not seen as strictly alternatives. Firms must use various combinations of these approaches in order to better employ ambidexterity in their context. In this study, these assumptions are confirmed, as three out of four approaches, described in the figure above, are used in the aerospace and defense companies under investigation. In Table 8.3 that follows, this section concludes with a summary of key findings presented in this chapter.

Table 8.3: Summary of key findings in the aerospace and defense companies

Organizational ambidexterity in the three companies under study	
Levels of analysis	**Description**
Micro-level of analysis: ambidextrous leadership	Leaders act mostly as managers. Most of their time is devoted on everyday activities (exploitation), while some of the time is used on future planning (exploration). • **Transformational leadership**: motivation and individualized consideration • **Transactional leadership**: clarification of goals
Meso-level of analysis: a multilevel approach to ambidexterity	Low overall ambidexterity penetration (horizontal, vertical, organizational) • Low horizontal ambidexterity penetration: o **Senior management level**: partial focus on ambidexterity o **Middle management level**: full focus on ambidexterity o **Employee level**: partial focus on ambidexterity • High vertical ambidexterity penetration due to the existence of an effective communication between the levels • Low organizational ambidexterity penetration due to the existence of a hierarchical organizational structure and low environmental dynamism

Macro-level of analysis: industry	The aerospace and defense companies use the **Defender** and the **Prospector** strategies • The key strategy is to achieve the best product with the available funding. The balancing of cost, time, and quality are the primary goals of the units. • Low to medium environmental dynamism for the two of the three large companies: high barriers of entry and few competitors • Medium to high environmental dynamism for the smallest company • The ambidexterity approaches that are promoted in all of the companies are as follows: o **Contextual ambidexterity approach**: Simultaneous focus on both exploration and exploitation within projects from team members o **Structural ambidexterity approach**: Multiple teams work on the current projects, and multiple teams work on the future projects in different business units. o **Punctuated equilibrium**: Some large projects are split in the middle and managed as different projects, one exploitative and one explorative. o **Reciprocal ambidexterity approach**: not applicable

8.3 Initiatives of ambidexterity and leadership in the aerospace and defense companies

Having thoroughly analyzed how top management teams manage ambidexterity in the aerospace and defense companies and how ambidexterity penetrates across multiple organizational levels, below some initiatives as described by the CEO in Company 3 and project leader in Company 2 are presented, which take place both in the medium-sized and large companies. These initiatives reveal how ambidexterity is initiated during a project management in the A&D companies under investigation.

8.3.1 Initiative X of a project management in medium-size companies

This section refers to initiative X, according to the description provided by the CEO in Company 3. This initiative reveals how individuals initiate ambidexterity at multiple levels, during a project management in medium-sized companies.

In the majority of the cases, the medium-sized companies in the defense sector are operating in the business of defense system upgrades or develop and produce components and subsystems for complex defense systems produced by large defense companies. In the latter case, they operate as subcontractors to the prime contractor for major government contracts.

When operating as contractors for a defense contract, these medium-sized companies need to stretch their resources in terms of human capital as they have to provide design, development, test, and production for the capability under contract, while at the same time, they need to provide for administrative and project management support, training, documentation, and logistics support. Moreover, government contracts usually require high standards in terms of quality control and certification

of the delivered products. These requirements result to the need of the production of an extensive number of document deliverables, which in many cases require more human resources, time, and effort for the production than the development and production of the product itself.

Being medium-sized companies with an average human capital of 50-500 persons, it is not always feasible or cost efficient to adopt an organizational structure that foresees adequate specialized personnel for each of the required tasks. Therefore, there is a need for a certain number of personnel to be able to multitask, i.e., to possess the training, knowledge, and determination to perform a diverse number of tasks according to the particular project requirements or the particular phase of the project. For example, a team of three engineers could be involved in the designing of a product at the initial phase but also later be involved in the production of the documentation or the training of the customer's personnel. It is so just because the existence of a permanent and specialized customer training department is not sustainable within the company structure as it could be within the structure of a large defense contractor.

The above-mentioned multitasking approach generates the need for flexible management techniques that could make the dynamic resource allocation possible. Therefore, the organizational flexibility that is compatible with the application of ambidextrous management style can be considered a key advantage that could ensure the success of this type of companies, at the fierce competition for defense contracts in the national and international market.

The adoption of the optimal execution plan is critical for the success of the undertaken projects, as a failure to deliver the contracted capability within the specified period of performance will result to substantial financial penalties and consequent losses. In order to select the optimal plan, the managers shall be flexible and adaptable in reconfiguring the project team to include the most suitable experts. Therefore, the consistence of the human resources becomes the most critical component and the most valuable asset of the medium-sized companies. This is result to the fact that a limited number team is required to perform diverse tasks at different phases of the project, and thus any under-qualified team member automatically becomes the weak link that can endanger the success of the project. This realization obliges the project managers and team leaders to be very selective for the composition of the project teams.

In the case that the medium-sized company does not have the capacity to undertake the responsibility to fully execute government contracts due to lack of expert knowledge for key project requirements, the wise management tactic is not to pursue the role of prime contractor. On the contrary, it can capitalize on the expert knowledge in a particular field and/or the novel products (components) that it has developed and assume the role of subcontractor to a much larger company that will become the prime contractor for a larger scale government project. In such a contractual arrangement, the medium-sized company can focus on the production of its superior subsystem or component and not expend any resources for the rest of the program requirements which are taken over by the prime contractor who either has the manpower and the resources to accomplish them himself or can well go into contract with other subcontractors for their provision. The pursuit of subcontracting

projects, instead of prime contracts with the government, reduces drastically the project risk for the medium-sized defense companies. However, the reduction of risk is almost always associated with the reduction of the profit margin, as the prime contractor, who is undertaking the overall project risk, makes sure that the project structure foresees for him adequate profit, which in case of project execution problems will become the management reserve that will limit the losses.

Following the above analysis, it becomes evident that the selection of the suitable human resources and the strategic decisions, to pursue prime government contracts with full responsibility and execution risks or subcontracting tasks for major defense contractors, are the key management decisions that will define the success of a medium-sized defense company. The application of ambidextrous techniques can be applied at the particular case, as the decision for prime contracting option is most relevant to exploration while subcontracting option is relevant to exploitation. It is evident that the correct mixture of these two options based on educated analysis from proficient experts (human capital) are the keys for the success of a medium-sized defense company, at the fierce competition in the international defense market.

8.3.2 Initiative Y of a project management in large, multi-national companies

This section refers to initiative Y, according to the description provided by a project leader in Company 2. This initiative reveals how individuals initiate ambidexterity at multiple levels during a project management.

By the term “large companies” in the aerospace and defense sector, we consider the companies that employ several thousands of expert staff, usually located across

several countries and which produce complex military systems of multi-million-euro value. Their customers are almost exclusively governments or airline companies. In some cases, these companies are partially or totally owned by the governments, in which case they receive exclusive government contracts and their structure and corporate culture resemble governmental organizations. However, the majority of these companies is obliged to compete in the international market for the large defense projects that are undertaken by almost all countries, but especially from the ones that face security threats. This fierce competition in the international market of armaments dictates to their management to select a calculated mixture of risk-taking and conservative management actions in order to provide low-risk support and update services for their already fielded products and concurrently implement high-cost/high-risk development of new projects. In this way, by capitalizing on the R&D efforts at each new project, they keep expanding their knowledge base and the level of maturity and quality of existing products, while the frequent introduction of novel products is essential in order to keep them ahead of the competition; all these properties are compatible with the ambidextrous management concept.

The companies in question that operate in the aerospace and defense sector face similar challenges to the ones faced by companies in the high-tech sector, such as consumer electronics or the automotive industry. However, there are some significant differences that are related to the type of their customers: Instead of relying on thousands or millions of consumers for their profit, they have to target few large contracts almost entirely from governments or major airline companies. In this sense, the stakes for the success or failure of each contract are extremely high and a

failed contract could potentially have severe or even catastrophic effects to the financial health and the future of the company.

As far as the management style is concerned, the "primordial" question on the priorities for the allocation of the limited resources to exploitation or exploration activities is also valid. A key difference in the aerospace and defense industry compared to the more consumer-oriented industries is that the life-cycle of the aerospace and defense products is usually much longer, sometimes spanning over several decades. This fact renders the need for innovation less time critical, allowing a company to capitalize gains from a particular successful product for several years without the need for continuous innovation. However, the need for new and innovative products is always relevant, and this industry needs to eventually produce new products that outperform the competition in order to achieve the lucrative multi-million contracts.

Another key parameter, which is related to the long life-cycle of the aerospace and defense products, is the business of upgrade, update, and continuing support of the old (usually called legacy) products. Due to their high cost, the products of this field involve a considerable investment for their replacement. Therefore, several customers, especially at the current tight economic situation, that cannot afford the cost of replacement of the legacy products decide to undertake life extension or performance upgrade projects. These types of projects may amount to a considerable percentage of the workload of such an industry and, if properly managed, may become a considerable source of profit. Even without performance upgrades, the legacy systems usually require intensive support services that, in some cases, only

the original manufacturer can provide and thus become another considerable source of profit. These two types of “after sale” support services are usually low-risk and can provide a steady source of income for extended time periods, becoming the exploitation side of the management effort.

As it has been noted, the fact that the aerospace and defense products inherently provide the opportunities for their continuing exploitative activities via after sales services does not mean that an industry in this field can rely its long-term survival on those. An ambidextrous management approach would dictate the exploitation of this low-risk steady income to allow investment on new innovative products that would guarantee future contract and thus the longevity of the company.

Following the above analysis, a proper mixture of exploitation via the allocation of resources on the support and upgrade of legacy products and exploration via investment on the development, testing, and marketing of new and innovative products is the key for the optimal application of the ambidextrous management principles in the aerospace and defense industry. The companies that over-relied on the low-risk profits from the support of certain successful legacy products and had been hesitant to allocate part of their profits for the long, costly and risky development of new products eventually faced survival problems as they had not been able to achieve any new contracts. That has been the main reason for hundreds of acquisitions in this sector that took place during the 1990s, which left only few global players in this field. Two of the reasons that forced old, successful companies to failure had been the decrease of the demand of weapons as aftermath of the cold war in the early 1990s, and the extensive introduction of the electronics as key

integral part of all aerospace and defense. As the electronics are known to have shorter life-spans compared to the traditional mechanical-based legacy products, the lifecycle of these products started to shrink, rendering the need for new or upgraded products more critical, a need that could be met only with the investment in new, innovative products that is possible only via the management's orientation towards the exploration effort.

Finally, it must be noted that several new, smaller-sized companies have been founded in the field of aerospace and defense that, in some cases, work as sub-contractors to the large and established companies but, in certain cases, attempt to challenge the large companies in the field of after-sales services of their legacy products by providing either upgrades or logistics support services. The lower management cost of the medium-sized companies allows them to bid for lower prices and thus have more chances for winning the contracts. Moreover, the fact that the development cost of electronics products, and especially the development of new software, requires very low investment in infrastructure (compared to heavy mechanics-oriented industry), it allows more and more small to medium-sized new players to challenge the large and established aerospace and defense giants. In this case, the problem for the large companies is that these new players have the potential to "steal" from them a part of their profit that was considered low-risk and assured: the follow-on and after-sales support of their legacy products. This relatively new development is making ambidextrous management more relevant for the large aerospace companies, as they can no longer be assured that their after-sales support services profits will allow them the luxury to slowly invest in new products: the need for innovation has started to become more pressing, and the adoption of

ambidextrous management principles becomes necessary, leading to the concurrent pursuit of exploitation and exploration activities.

8.4 Summary

In summary, in this chapter, the interview findings as retrieved from the participant questionnaires of three aerospace and defense companies are described in detail. At the beginning, the chapter introduces the analysis of findings that takes place at the micro-level of the companies regarding ambidextrous leadership. Then, it continues with a meso-level of analysis that deals with ambidexterity penetration across levels, and finally it presents the macro-level analysis of the findings regarding ambidexterity approaches as found in the companies under study. The chapter concludes with some of the initiatives that take place in these organizations that lead to a more comprehensive understanding of ambidexterity and leadership in the aerospace and defense companies.

More specifically, in the micro-level of analysis, findings retrieved from participant questionnaires in the aerospace and defense companies are classified into first-order concepts, and then into aggregate dimensions. In that regard, they show that leaders in these companies occupy the role of ambidextrous managers, who use mostly transactional leadership style. Due to highly centralized organizational structures, with many organizational levels and low dynamism of external environment, they mostly focus on the clarification of goals. In addition, they tend to intervene, whenever deemed necessary, in the project management. On the other hand, they also use some form of transformational leadership style, where they communicate

high expectations to their employees and focus on the individualized consideration of these employees.

On the meso-level of analysis, the findings show how ambidexterity penetrates at the multiple organizational levels in the aerospace and defense companies. More specifically, it is observed that there is a low horizontal ambidexterity penetration in these companies, both at the senior and employee levels. There is a high vertical ambidexterity penetration due to the alignment of the decision-making procedures between levels and good communication skills between the employees. Finally, there is low organizational penetration in companies, due to highly centralized organizational structure and low environmental dynamism of the industry. Overall, these companies present a low ambidexterity penetration at multiple levels of management.

In the macro-level of analysis, the findings show that the aerospace and defense companies use both the Defender and the Prospector strategies. Here, the key strategy is to achieve the best product with the available funding. In addition, the balancing of cost, time, and quality are the primary goals of the units under study. The two large companies under investigation operate in a low dynamism environment, where there are high barriers of entry and few competitors, while the medium company operates in a medium dynamism environment. Most importantly, three out of four ambidexterity approaches are promoted in all the companies under study, which are contextual and structural approaches, as well as punctuated equilibrium. Reciprocal ambidexterity approach was not found in these companies.

The chapter concludes with some of the initiatives of ambidexterity and leadership observed in the medium-sized and large companies. These initiatives reveal how ambidexterity is initiated during a project management in the aerospace and defense companies under investigation. They also highlight the challenges of ambidextrous leadership at the two types of businesses that had been analyzed.

More specifically, in the medium-sized company, leaders (senior executives) struggle between the decision to pursue contracts independently with higher revenue but also higher risk or to settle with lower revenue under the umbrella of a major player in the field as subcontractors. The ability of the management to balance both types of activities in the right mixture according to the market conditions is the key challenge for ambidextrous leadership. On the other side, at the large corporations, the research uncovered different types of challenges that are relevant to the decision to invest resources for the support and upgrades of old but successful products by extending their service life or investing in the development of new, innovative products. This has been the classic challenge of ambidextrous managers in all types of businesses. However, it is particularly relevant for the sectors under study, as defense products are usually of extremely high value and have lifecycles that span several decades. The structure of this chapter is graphically illustrated in Figure 8.4.

In the following chapter, the research findings are discussed and analyzed in detail of all the organizations under investigation, both government and private. The chapter presents ambidextrous leadership, where findings are analyzed based on the leadership approaches of transformational and transactional leadership styles in the strategic leadership theory. The chapter, then, continues with the discussion of

ambidexterity penetration at multiple levels of the companies under study, while extending Andriopoulos & Lewis's (2009) previous study on ambidexterity tensions that take place at multiple organizational levels in high-tech companies. A cross-case analysis follows, where the similarities and differences among organizations of different types and sizes are presented and analyzed. And finally, the chapter concludes with the analysis of organizational ambidexterity based on Miles & Snow's (1978) research about organizational types and adaptive cycle. The contributions to theory, research, and practice are highlighted, while future research directions are also proposed.

Chapter 8
Findings: Aerospace and defense companies

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Figure 8.4: Summary graphic of chapter 8

CHAPTER 9

DISCUSSION AND CONCLUSION

9.1 Introduction

In this chapter, the findings of the detailed analysis of ambidexterity in the aerospace and defense organizations that has been presented in the previous chapters are discussed in detail. More specifically, in the beginning, the findings on ambidextrous leadership are analyzed and a cross-case analysis highlights the similarities and differences both in the conception and application of ambidextrous behaviors among the studied companies and organizations according to their type and size. Then, the chapter continues with the presentation of the results of the multilevel analysis of the ambidexterity penetration across the multiple levels of the corporate structure, which is the main objective of this study. Cross-case analysis is again used to detect differences and similarities in ambidexterity penetration among the studied organizations. Finally, the chapter concludes with the analysis of the results on organizational ambidexterity found in all the companies under investigation as a result of their particular leadership styles and ambidexterity penetration. In all the research topics, contributions to theory, research, and practice are highlighted, and the limitations are noted, while future research directions are also proposed.

9.2 Ambidextrous leadership

9.2.1 Cross-case analysis between case studies on ambidextrous leadership

Cross-case analysis reveals both similarities and differences between the public international organization and the three private aerospace and defense companies. With respect to differences, leadership is expressed in a slightly different way in these two categories of companies. In the international organization, good communication skills, motivation/inspiration of employees, and leadership expertise and experience seem to be the most significant attributes of effective leadership, while in the private companies, honesty is also considered to be essential. In addition, employees in the public organization consider coordination, direction and guidance, as well as the setting of ambitious but realistic objectives to be typical characteristics of an efficient leadership behavior; while in the private companies, clear expectations, discipline, and a structured way of thinking are regarded as more important to ensure task completion and goal attainment. In addition to the main attributes, transformational leadership in the international organization is promoted through motivation, an attribute that is absent in private companies.

Moreover, the analysis of certain initiatives that had been reviewed in both the cases revealed differences in the application of ambidexterity by the leaders, while in the international organization, they are focused on delivering at minimum cost within schedule, and at the private industries, they are focused on short-term profitability and long-term survivability. In addition, even among different private industries, the study uncovered differences in the challenges of the leaders according to their company size, while large companies appear to balance between the short-term gains from the support of current products and the development of novel products, and the

medium-size companies seem to balance between risking autonomous ventures with high profitability and low-risk, but also lower profit, sub-contracting activities.

Despite the mentioned differences, there are also some significant similarities. Ambidexterity in both the public organization and the private companies is reflected in diverse leadership behaviors. Therefore, the contingency theory is both reflected in the consideration leader behavior and initiating structure leader behavior. In addition, both transformational and transactional leadership styles are found to promote ambidextrous leadership in both of the case studies. Finally, leaders act as ambidextrous managers in all the organizations under examination, as transactional leadership seems to be more significant than transformational leadership. This situation could be explained by a complex structure that these organizations present, as well as by the fact that they operate in a low to medium dynamism environment and have multiple organizational levels and business units. Therefore, clear guidance and coordination are more important than motivation of employees. A brief synopsis of the above case-study analysis is presented in Table 9.1 below.

Table 9.1: Differences and commonalities observed at the individual level

	Cross-case analysis
Differences	• Ambidexterity is reflected in diverse leadership behaviors, differently for the public international organization and for the private aerospace and defense companies. • Transformational leadership style is expressed in a different way and is more behaviorally complex in the international organization. • Ambidexterity is expressed with different initiatives as the challenges differ between government and private organizations as well as between large and medium-sized companies.
Commonalities	• **Paradox of leadership behaviors (contingency theory)** (a) Consideration leader behavior: mostly promoted through good communication skills and motivation/inspiration of subordinates (b) Initiating structure leader behavior: mostly promoted through direction and coordination • **Ambidextrous leadership** (a) Transformational leadership: mainly achieved through communication of high expectations and individualized consideration of employees (b) Transactional leadership: mainly achieved through clarification of goals and intervention, when necessary • **Leaders act mostly as ambidextrous managers**

9.2.2 Insights about ambidextrous leadership

This study extends previous understanding of ambidextrous leadership. Earlier empirical studies have shown that if paradox exists in the environment, it should be reflected in leadership behavior (Denison et al., 1995). Two types of behaviors have been found to be especially typical of effective leaders, which according to contingency theory are consideration leader behaviors and initiating structure leader behaviors (Galbraith, 1973; Lawrence & Lorsch, 1968; Raisch & Hotz, 2010; Thompson, 1967). More recently, this concept was specialized to ambidextrous leadership, which in turn is proposed to be a combination of two leadership styles, transformational and transactional leadership, in this study.

Leaders should consider all the internal factors such as tensions, as well as the external factors such as the organizational structure and the dynamism of the environment to promote ambidexterity (Kortmann, 2011). This assertion is based on the fact that interdependence has been observed among ambidextrous leadership, organizational structure, strategy, and external environment (e.g. Carmeli & Halevi, 2009; Davis, Eisenhardt, & Bingham, 2009; Fiss, 2011; Heracleous & Werres, 2016; Raisch, Birkinshaw, Probst, & Tushman, 2009; Raisch & Hotz, 2010; Smith & Lewis, 2011; Yukl, 2008).

Based on the above logic, this research on ambidextrous leadership was conducted in the aerospace and defense organizations. The research findings show that almost all the employees consider good communication skills the most valued characteristics of an effective leader. In addition, all employees demand direction, goal specification, and coordination. These effective leadership behaviors are considered to promote

ambidexterity in the organizations. Although both leadership styles are found in different degrees in all the organizations under investigation, transactional leadership appears to prevail in these companies instead of transformational leadership. This is in accordance with Birkinshaw & Gupta's (2013) statement, who argue that some organizations are more ambidextrous than others, and this is in line with Bass' (1985) assumption that all leaders exhibit characteristics of both transformational and transactional leadership styles, where individual leaders tend to put higher emphasis on one of these styles than the other. In that regard, it can be observed that leaders occupy more the role of an ambidextrous manager by mostly using goal achievement (transactional leadership style), than motivation or inspiration (transformational leadership style).

In addition, Raisch & Hotz (2010) have argued that efficient exploitation of existing capabilities in standardized, centralized, and hierarchical organizations hinder the forces of innovation and flexibility required for the exploration of new capabilities. Likewise, Davis et al. (2009) have mentioned that less dynamic environments favor efficiency, as the pressure for exploration is low, while Eisenhardt (2013) has stated that firms with too much structure are too constrained and lack flexibility, which restricts senior managers to a specific timeline and budget line. The above research's outcomes are in line with the findings of this study, which implies that due to strictly structured organizations with multiple organizational levels and due to a low to medium dynamism external environment of these organizations, leaders are observed to resort to the use of mostly exploitative activities, goals settings, and coordination, while explorative activities, innovation, and motivation of subordinates are less frequently used.

9.2.3 Contribution to theory, research, and practice

Studies on ambidextrous leadership raise the question about what specific behaviors and leadership styles accomplish ambidexterity and how organizational constraints influence ambidextrous leadership. Research has shown that leaders use a complex set of behaviors that includes two poles (Carmeli & Halevi, 2009; Denison et al., 1995; Havermans et al., 2015; Westley & Mintzberg, 1989; Yukl & Van Fleet, 1992), where higher emphasis is given on one of these poles compared to the other (Bass, 1985). The findings of this study confirm this assumption, as one of the poles (exploitative) is observed to be stronger than the other (explorative). Birkinshaw & Gupta (2013) have also supported that it is likely that some firms are more ambidextrous than others, while it seems unlikely that a firm can deliver the highest level of achievement on both dimensions simultaneously, a notion that is consistent with the findings of this study. Therefore, this research contributes to a fundamental, yet overarching question in strategic management of how ambidexterity is achieved through effective managerial capability.

First, this study contributes to ambidextrous leadership theory by explaining how individual actions are consistent with exploration or exploitation. This research extends previous understandings on how structure and environmental dynamism influence individual actions (Davis et al., 2009; Jansen et al., 2009). More specifically, in this study, the above view is connected with ambidextrous leadership theory and it is found that highly structured organizations that operate in medium dynamism environments constrain leadership actions, where leaders in turn prefer to put more emphasis on exploitative activities and less on explorative activities.

Second, in this study, it was revealed that micro-level leadership behaviors are linked with their macro-level activities that take place in the aerospace and defense industry (Aguinis et al., 2011). Ambidextrous leadership, by definition, tries to optimize corporate performance at the macro-level of the organization through leadership behavior at the micro-level. In this context, this study attempts a detailed description of the organizational levels from the ambidextrous leadership perspective (Davis et al., 2009; Galbraith, 1973; Rosing et al., 2011). The findings of this study also add to this perspective by uncovering how ambidextrous leadership is perceived in the aerospace and defense industry, where mostly exploitative activities are used, a fact that is observed while taking into account different sets of behaviors, as well as organizational structure and environmental dynamism of all the firms under investigation.

Third, the analysis of the leadership behaviors as part of the key initiatives that are undertaken in the respective organizations uncovered significant differences in the concept and practice of ambidexterity due to the fact that the type (government vs. private) and the size (medium vs. large) of the organization dictate different challenges that consequently require different behaviors. Although this finding is not unexpected, it highlights the fact that there is no universal recipe for ambidexterity that leaders could apply in every type of organization. On the contrary, successful ambidextrous leaders should be able to capitulate on their past experience and adapt their strategic decisions based on the particular corporate environment and challenges. In addition, as it has also been stressed upon in the introduction that the particular sector of aerospace and defense, which comprises both the government organization and large multinational companies, has not been studied in existing

literature, in terms of leadership behaviors and ambidexterity penetration across the different levels of management. In this sense, this study contributes to the understanding of ambidexterity and leadership in a new field of business. An illustration of the above contributions to ambidextrous leadership theory is presented in Figure 9.1 below.

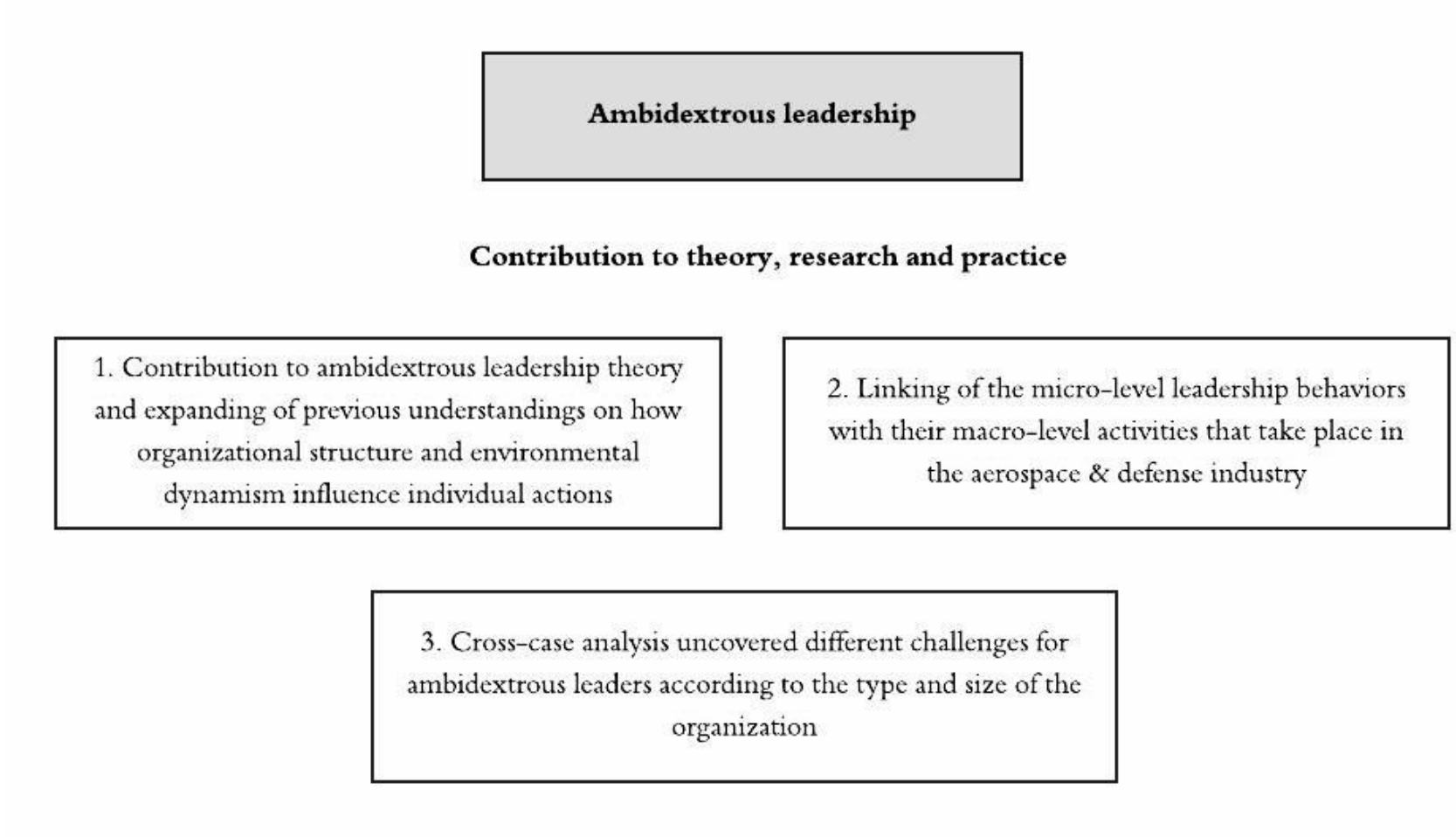

Figure 9.1: Contribution of this study to ambidextrous leadership theory

9.2.4 Future research directions and limitations

Future research should focus on ambidextrous leaders that show a more balanced approach to transformational and transactional leadership styles by pursuing simultaneously exploration and exploitation-oriented objectives, and future studies should also investigate how these leaders succeed to outperform other individuals and top executives that focus mostly on one of the two objectives.

Future work should also include more factors in the implementation of ambidextrous leadership decisions in the organizations, as the linkages between ambidextrous leadership and organizational ambidexterity are complex and include inherent socio-political processes as well, with the intra-organizational dynamics contributing to a large extent into the shaping of organizational phenomena. Therefore, more factors may contribute in theorizing this complex relationship, where intra-organizational tensions and extra-organizational factors are internalized in the leadership style of executives. Correlation with the type and size of the organization should definitely be considered.

Finally, a potential limitation of this study can be the fact that it does not include a larger number of entrepreneurial companies, where one could potentially compare and contrast ambidextrous leadership traits between individual managers and entrepreneurs: How they manage exploration–exploitation tensions, and how they influence firm performance. The extension of the study to a more diverse sample of organizations, in terms of size and type, could potentially uncover additional factors and relationships between the ambidextrous leadership behaviors, the corporate culture, and the particular business challenges in the sector under study.

9.3 A multilevel approach to ambidexterity

9.3.1 Cross-case analysis between case studies about ambidexterity management

Cross-case analysis has mostly shown similarities between the two case studies at the organizational level. More specifically, there is a clear hierarchy observed in all the companies under investigation. However, there is also an established process for the involvement of all the stakeholders in order to facilitate a well-informed decision-making. In that respect, the higher management makes the decisions, while taking into consideration project leaders' consultation regarding dissipating the responsibilities to lower levels.

Three types of tensions appear to be highly important for the promotion of ambidexterity in all the companies under investigation at the three levels of management: the senior management level, the middle management level, and the level of employees. In that regard, ambidexterity is partially found at the senior management level. Even though the primary goal of senior executives is cost savings, these savings do not originate from areas where substantial ones could be achieved. At the same time, innovation is not sufficiently promoted, as risk taking is not adequately supported. In addition, it is clear that alignment between the higher and the middle management levels is achieved through communication and clear messages, even though tensions are still present. Communication is mostly promoted in the form of formal as well as informal meetings.

In contrast, the results of this study have shown that ambidexterity is fully observed at the middle management level. Project leaders seek to develop high quality customer relationships, while attempting to deliver projects on time and within

budget. Even though there is not much room to deviate from the goals that have been clearly set by the higher management, project leaders are still free to improvise and try to implement their own management style as long as they stick to the predefined timeline and budget limits.

Finally, ambidexterity is, again, partially found at the employee level. Employees are asked to develop products in short timeframes with limited budget, while creative and innovative ideas are not sufficiently promoted. Goals and deadlines are explicitly defined at the start of each project and senior management promotes creativity only in restricted limits. Tensions arise in everyday communication between employees and project leaders, which are mostly attributable to the lack of specialized knowledge on behalf of employees, their diverse academic and professional backgrounds, excessive e-mail exchange, and lack of adequate face-to-face communication. However, alignment is achieved through extensive dialogue, which is used among employees and project leaders, and in the cases where team members fail to come to an agreement, they seek to achieve resolution through higher management intervention. An illustration of the above similarities is presented in Table 9.2 below.

Table 9.2: Commonalities observed at the firm level

	Cross-case analysis
Commonalities	• Clear hierarchy in the decision-making process, while also involving lower management level propositions for the proper dissipation of responsibilities. • **Low level of an overall ambidexterity penetration in organizations.** (a) Low level of a horizontal ambidexterity penetration within the organizations. o Partial focus on ambidexterity at the senior management level. o Fully observed ambidexterity at the middle management level. o Partial focus on ambidexterity at the employee level. (b) High level of a vertical ambidexterity penetration across the three levels in the organizations. (c) Low level of organizational ambidexterity penetration in the organizations under investigation.

9.3.2 Insights about the multilevel approach to ambidexterity

This research extends previous understanding of exploration–exploitation tensions across multiple organizational levels. Earlier empirical studies have shown that ambidexterity plays a positive role on firm's performance, within the constraints provided by the organizational context (Gibson & Birkinshaw, 2004; Raisch & Birkinshaw, 2008). Previous research has also presented that the ambidexterity "dilemma" exists in different units and at multiple levels. For instance, the unit responsible for exploration, such as R&D department, is not only seeking for new opportunities but also building on existing resources of the rest of the organization (Hill & Birkinshaw, 2014). Equally, the unit that is responsible for exploitation, such as manufacturing department, is not only spending most of the time on cost efficient procedures but also looking out for process improvements (Birkinshaw & Gupta, 2013).

The same logic applies at multiple organizational levels. Exploration–exploitation tensions get repeated through various levels of hierarchy in the organization, starting from the highest level of management and getting down to individual employee level. There also exists some blend of exploration and exploitation at each level (Andriopoulos & Lewis, 2009; Birkinshaw & Gupta, 2013). In that regard, this study examines the ambidexterity penetration through multiple organizational levels in the aerospace and defense organizations, from the top management down to the employee level. This research also analyzes in depth the exploration–exploitation tensions at each of these levels.

More specifically, by examining the horizontal ambidexterity penetration in the organizations, the findings of this study show that there are different degrees of effectiveness of how ambidexterity practices penetrate horizontally across each of the levels. Poor management of exploration–exploitation activities is observed at the senior management level. Neither cost efficiency nor innovation constitute the top priority of senior management. High performance seems to be achieved in a less cost-efficient way. At the middle management level ambidexterity, practices penetrate quite well, as project leaders prefer not to deviate from goals, while promoting innovation and improvisation in projects. Finally, at the lower employee level, a poor level of a horizontal ambidexterity penetration is observed. Even though individuals deliver projects in short time frames and with limited budget, creativity does not appear to be of a high priority.

Moreover, what seems important in the organizations is the vertical ambidexterity penetration across the levels. Alignment of strategic level decisions with project level activities, proper communication, and resolution of tensions promote ambidexterity between top management and middle management teams. However, informal communication is more preferable than a formal one, showing that the ease in personal contact is considered as a necessary component for the unconstrained promotion of ambidexterity between the two higher levels. Communication and resolution of tensions are also important between project leaders and employees. Dialogue is extensively used in organizations to resolve complicated issues and procedures, which leads to an easier promotion of ambidexterity between the two lower levels. Overall, there is a satisfactory degree of alignment observed between the strategic-level decisions and project-level activities even though difficulties in

communication are also present, which in turn promotes an effective vertical ambidexterity penetration across levels in the organizations.

Finally, Raisch & Hotz (2010) have argued that in dynamic environments, organizations are mostly oriented towards exploration. In stable environments, however, organizations prefer a more balanced orientation, as explorative projects are too risky when companies compete with established competitors. Therefore, exploitation is preferred for increased efficiency and enhanced performance. Further, organizations in this study are exploitation-oriented. As it has been observed, individuals at multiple levels focus mostly on exploitative activities. The pressure for exploration is low, as the highly centralized and hierarchical structure of their organizations, in combination with a stable external environment, favors efficiency (Davis et al., 2009; Eisenhardt, Furr, & Bingham, 2010). However, even though centralization in the organizations may support exploitation, it also creates problems as it limits communication, reduces the quantity and quality of knowledge flow across the levels, and leads to decreased employees' motivation to generate innovative ideas (Raisch & Hotz, 2010). Thus, as expected, the exploitative orientation of these organizations is confirmed by the observation of a satisfactory level of organizational ambidexterity penetration. This is manifested in their organizational structure and strategic orientation, and it is also demonstrated by their strong environmental dynamism.

In sum, even though organizations under study present a high vertical ambidexterity penetration, they also show low levels of horizontal and organizational ambidexterity penetration. For all the above reasons, therefore, this study concludes with the

acknowledgement that there is a low level of overall ambidexterity penetration (horizontal, vertical, and organizational) across the multiple levels in the aerospace and defense organizations under examination (Andriopoulos & Lewis, 2009; Bledow et al., 2009; Chandrasekaran et al., 2012; Papachroni et al., 2016).

9.3.3 Contribution to theory, research, and practice

Studies on organizational evolution raise the question of how and why some organizations survive while others fail. Therefore, this research contributes to fundamental, yet overarching questions in strategic management of how ambidexterity can be managed across multiple organizational levels and how exploration–exploitation exchanges take place across multiple levels of ambidextrous organizations, as ambidexterity becomes more and more important for the long-term prosperity of organizations.

More specifically, first, this research is based on Andriopoulos & Lewis's (2009) work, while it also extends the above study by proposing additional levels of ambidexterity penetration. In that respect, in this study, ambidexterity penetration is proposed to take place not only at each level but across levels as well. Therefore, exploration–exploitation activities can penetrate within organizations at the same level (horizontal ambidexterity), across levels (vertical ambidexterity), and through the entire organization (organizational ambidexterity).

Second, this study extends both Birkinshaw & Gupta's (2013) and Boumgarden, Nickerson, & Zenger's (2012) research and links ambidexterity with firm performance. More specifically, in this study, it is suggested that organizations can

be classified into categories under which they may achieve high ambidexterity penetration, if they achieve the proper balance of exploration–exploitation across organizational levels. Otherwise, if they miss some or all the elements that have been previously specified, they present low ambidexterity penetration within the organization. Thus, we observe a low overall ambidexterity penetration in the organizations under study.

Third, in general, this study extends previous understandings about how ambidexterity can be managed within organizations at multiple levels. Only few scholars have approached a multilevel study of ambidexterity (Birkinshaw & Gupta, 2013; Turner et al., 2013). This research thus analyzes how exploration–exploitation tensions are managed on top management, middle management and employee levels, while it also measures the perceptual performance of these tensions in the organizations under investigation.

Fourth, this study extends previous research of Chandrasekaran et al. (2012), Heyden et al. (2015) and Turner & Lee-Kelley (2013) about ambidexterity penetration at the middle management level in the aerospace and defense sector. It is noted that most of the collected research data (in the form of interviews across all organizational levels) uncovered the key role of middle management for the ambidexterity penetration across the organizational levels. The middle management, as represented by the project leaders at the investigated organizations, was portrayed as the strong link of the organizational structure because they established seamless upward and downward communication for the successful implementation of mostly exploitative activities. Therefore, the role of the project manager, as the key figure of the middle

management, has been highlighted as of paramount importance for the structural integrity of the management model and subsequently for the successful implementation of ambidextrous practices at all the types of the studied organizations, including at the low-dynamism international organization. This particular finding, that highlights the importance of the middle management as a cohesive element of the organizational structure that allows the seamless flow of ambidexterity practices across levels, can be considered as a key contribution of this study to ambidexterity research as it has not been sufficiently investigated in the existing literature, which does not investigate in detail the penetration of ambidexterity across the organizational levels. In Figure 9.2 below, the overall contribution of this study to ambidexterity through a multilevel approach is briefly depicted.

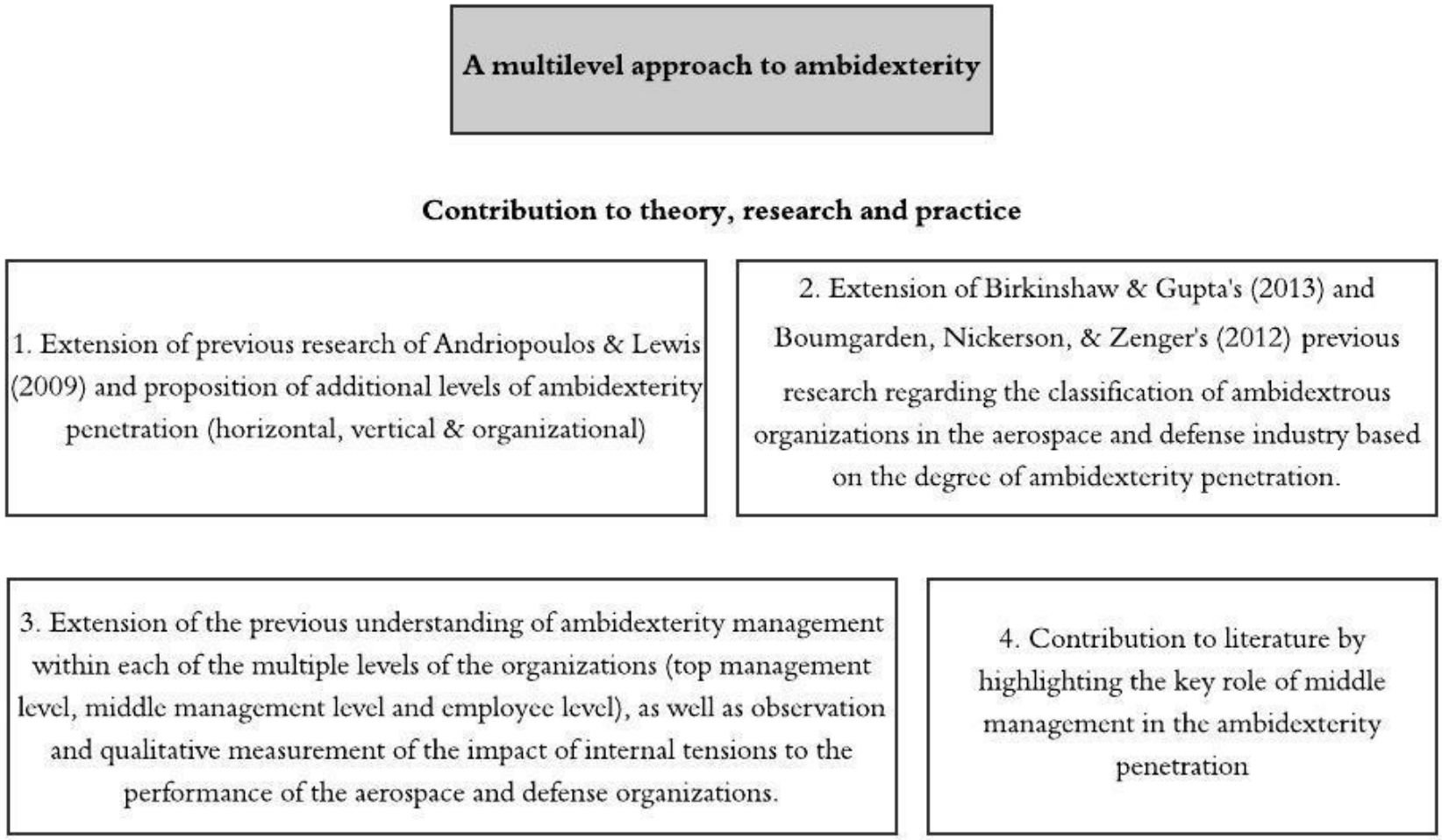

Figure 9.2: Contribution of this study to ambidexterity through a multilevel approach

9.3.4 Future research directions and limitations

Future research should more closely examine the links of ambidexterity between the levels. In other words, scholars should clarify whether we can really compare the different levels in terms of their ambidexterity or whether the observations are manifestations of the same ambidexterity concept occurring at different levels in different degrees of detail.

Moreover, this study is not without weaknesses. While the qualitative analysis of organizational ambidexterity at multiple organizational levels within aerospace and defense industry provides the benefits of richness critical to understanding the mechanisms that deliver ambidexterity in this industry, the limitations of the number of participants, as well as archival research are visible in this project. Data of this study is also limited by its sources and retrospective biases. In addition, while the international organization has a public-sector structure, it provides military assistance to member states, with much of its information being classified and thus not available to general public. For this reason, other factors that are not accessible to the researcher may have influenced the organizational dynamics and outcomes of this project. Thus, the findings of this study are tentative and a more comprehensive and large-scale empirical research is needed in this sector.

Finally, the selected cases are representative of the challenges encountered in the development of reliable data sets in the aerospace and defense industry. Furthermore, such cases can provide guidance for eventual construction of case studies pertaining firms in other sectors of industry.

9.4 Organizational ambidexterity: industry

9.4.1 Cross-case analysis between case studies at the industry level

Cross-case analysis reveals both similarities and differences at the industry level. With respect to differences, all of the companies under investigation, except for the smallest high-tech company, belong to a particular structural configuration that is called the defender. Their external environment presents low to medium dynamism; they try to be cost efficient, while through highly centralized actions, they achieve to maintain a stable and predictable internal environment. On the other hand, the smallest company belongs to a structural configuration that is called the prospector. Its external environment presents medium to high dynamism, and the company tries to focus on innovation, while presenting a simplified organizational structure.

Despite the above differences, there are also some significant similarities. All the companies under investigation try to balance cost, schedule, and performance, which are the primary goals of the units. However, the most important finding is that three of the four ambidexterity approaches are promoted in these organizations. More specifically, all the units under study implement a contextual ambidexterity approach, with a simultaneous focus on both explorative and exploitative activities within projects. In addition, the companies also use a structural ambidexterity approach with teams working separately on the explorative and exploitative projects in different business units. Finally, a punctuated equilibrium is also observed in companies, in which either some large projects are split in the middle and managed as exploitative and explorative projects interchangeably or they have matrix support teams that work first on exploitative and then on explorative projects in the same

business unit. A summary of the above cross-case analysis is presented in Table 9.3 below.

Table 9.3: Differences and commonalities observed at the industry level

	Cross-case analysis
Differences	The smallest company belongs to a structural configuration that is called the **Prospector** All other companies belong to a structural configuration that is called the **Defender** Medium to high environmental dynamism is observed in the smallest company, as well as innovative strategic orientation and simple structure Low to medium environmental dynamism is observed in all the other companies, as well as cost-efficient, strategic orientation and centralized, hierarchical structure.
Commonalities	The key strategy for all the companies is to achieve the best product with the available funding. The balancing of cost, schedule/time, and performance/quality are the primary goals of the units. The ambidexterity approaches that are promoted in all of the companies are as follows: **Contextual ambidexterity approach:** a team working on both explorative and exploitative activities in a project simultaneously **Structural ambidexterity approach:** different teams working separately on explorative and exploitative projects in different business units **Punctuated equilibrium:** a team working first on exploitative and then on explorative projects in the same business unit

9.4.2 Insights about organizational ambidexterity at the industry level

This study extends previous understandings on organizational ambidexterity. It builds on Miles & Snow's (1978) adaptive cycle and also incorporates recent research into this framework. There is interdependence among organizational structures, strategies, and their external environment in the aerospace and defense organizations under investigation. By taking such premises into account, Miles & Snow (1978), in their work, present three organizational types of companies, which are prospectors, defenders, and analyzers. In these companies, their senior management teams adopt certain approaches to balancing explorative and exploitative activities.

More specifically, this study deals mainly with defenders, which are referred to be structural configurations that have a highly centralized structure; they work in stable and predictable environments, while using mostly exploitative activities. Prospectors, on the other hand, that are also found in this study, use a less hierarchical organizational structure; they operate in highly dynamic environments and focus mostly on explorative activities. In the middle, there are analyzers, which are not found in this project; they present a balanced organizational structure, work in medium dynamism environments, and exhibit a more balanced approach to ambidexterity (Miles & Snow, 1978).

Therefore, according to the above description, all the companies under examination in this study belong to a structural configuration that is called the defender, except for the smallest high-tech company that is called the prospector. These companies work in a low to medium dynamism environment, while through highly centralized

actions and managerial decision-making, they achieve to maintain a stable and predictable internal environment. This is reflected in the way they manage explorative and exploitative activities, as they emphasize mainly exploitation in order to achieve cost efficiency, while their employees communicate through formal hierarchical channels across multiple levels. The smallest company, however, works in a medium to high dynamism environment, it is less centralized, and this facilitates the promotion of explorative activities, creativity, and innovative ideas among employees (Miles & Snow, 1978; Raisch & Hotz, 2010).

Moreover, March (1991), in his foundational work, has developed the notion that companies that manage to balance exploration and exploitation simultaneously achieve superior performance and long-term survival. In the same vein, other scholars have also proposed that if firms manage to implement organizational ambidexterity, they are more likely to achieve superior performance in relation to other firms (Raisch & Birkinshaw, 2008; Tushman & O'Reilly, 1996). More specifically, these companies must obtain the proper mix of exploration and exploitation in order to outperform their competition (Gibson & Birkinshaw, 2004; Junni et al., 2013). Accordingly, in this research, it has been found that the key strategy of the ambidextrous companies under examination is to achieve the best product with the available funding. The ambidextrous companies under investigation are striving to implement organizational ambidexterity efficiently in their internal environment and thus they aim to accomplish the proper mix of cost, schedule, and quality in order to achieve high performance.

Finally, Simsek, Heavey, Veiga, & Souder (2009), in their research, have stated that all four approaches to ambidexterity (contextual, structural, punctuated, and reciprocal) may be found in organizations in various combinations in different units. This statement is in accordance with the findings of this project, where companies under examination are observed to implement three out of the four ambidexterity approaches. In that regard, these companies use contextual ambidexterity approach with teams working on both explorative and exploitative activities in a project simultaneously. However, they also use structural ambidexterity approach, by employing different teams on separate explorative and exploitative projects in different business units. And finally, they implement punctuated equilibrium with teams working first on explorative and then on exploitative projects in the same business unit.

9.4.3 Contribution to theory, research, and practice

One of the key objectives of this multilevel study of ambidexterity is to present different organizational forms and approaches that are related to ambidexterity and link them to the leadership behaviors by examining the ambidexterity penetration across organizational levels. In that regard, Miles & Snow's (1978) framework is used to describe different organizational types (defenders, analyzers, and prospectors), which in this research are associated with ambidexterity. Therefore, this study extends Miles & Snow's (1978) adaptive cycle and also incorporates recent research on ambidexterity into this framework, in order to make a contribution in the field of organizational ambidexterity and strategic management.

Therefore, the focus of this study centers on the relation between organizational structure and strategy. More specifically, the three organizational types comprise three fields of problems that are linked to ambidextrous behaviors of top managers, so that they could adapt their organizations to the external factors of their environment. These three problems are entrepreneurial (scarce resources between products and markets), engineering (business model between production process and innovative technologies), and administrative (balance between centralized and decentralized structural approach). The organizations under investigation in the present study are found to be defenders and prospectors.

This study also contributes to the ambidexterity theory, showing the ambidexterity approaches found in the aerospace and defense companies. More specifically, these companies exhibit contextual ambidexterity with the simultaneous engagement of team members in exploration and exploitation in a single unit. In addition, they exhibit structural ambidexterity with different exploitation and exploration units, while emphasizing on exploitation. Punctuated equilibrium is also used in teams that devote their time on current projects first and then on future projects. Reciprocal ambidexterity approach is not found in these companies.

More specifically, according to Birkinshaw & Gupta (2013) and based on Simon's (1962) argument, organizations are nearly decomposable systems, with parts of these systems that communicate with each other. They also state that organizations that are managed effectively must have some blend of exploration and exploitation at each level, a fact that is confirmed by the findings of this research. In addition, according to Hill & Birkinshaw (2014), all the ambidexterity approaches cannot be strictly

considered as alternatives. In this sense, firms may attempt to explore various combinations of ambidexterity implementation that best suit their organizational context. Therefore, they are expected to pursue hybrid forms of organizational ambidexterity or hybrid ambidexterity. This research has confirmed these assumptions by showing that three out of four ambidexterity approaches have been combined and used by the companies under investigation. In Figure 9.3 below, the contribution of this study to organizational ambidexterity is briefly depicted, in relation to organizational types and ambidexterity approaches.

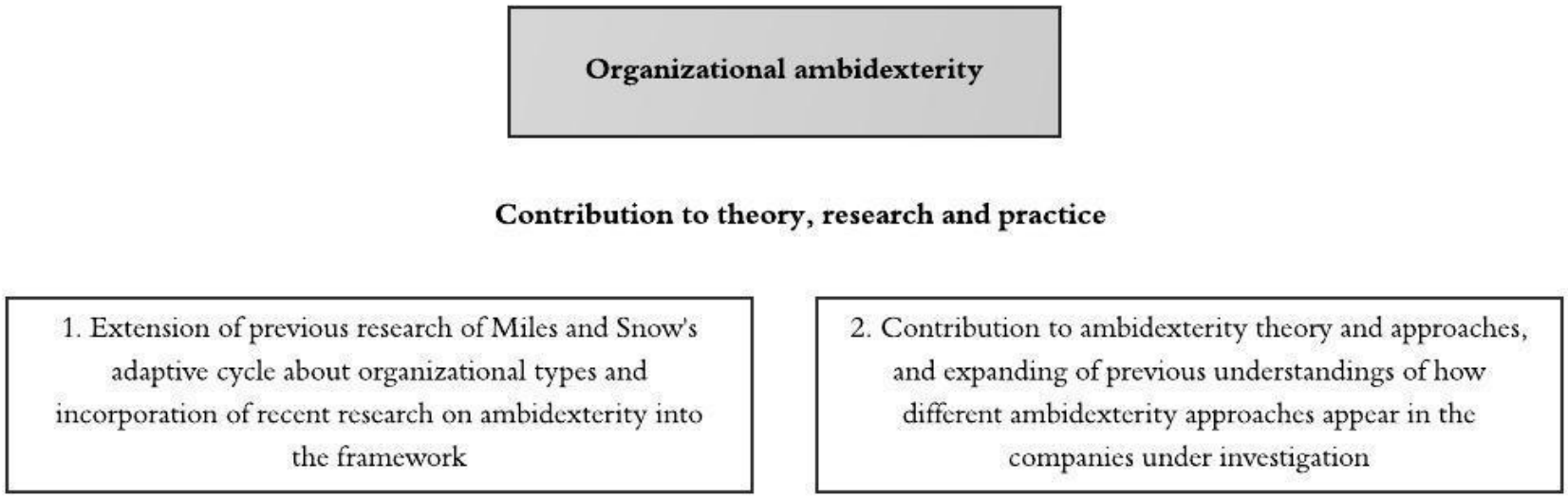

Figure 9.3: Contribution of this study to ambidexterity in relation to organizational types and ambidexterity approaches

9.4.4 Future research directions and limitations

Future research should more closely examine the links of ambidexterity between organizational structure and strategy. Scholars should also provide guidance with respect to ambidexterity approaches, while constructing case studies for other firms in other industries as well. A possible limitation of this research is that it does not include a larger number of entrepreneurial companies for a more comprehensive understanding of ambidexterity approaches and links of organizational types with ambidexterity.

9.5 Overall contribution to the field of ambidexterity and leadership

The main objective and contribution of this study has been to address ambidexterity in the less researched sector of aerospace and defense organizations via a multilevel approach (Birkinshaw & Gupta, 2013). This type of approach attempts to link the leadership of each organization (micro-level) to the organizational type (macro-level) by examining the penetration of ambidexterity through the organizational levels (meso-level). The study of ambidexterity penetration is not being restricted to vertical direction but extends to horizontal within each level. The collected data has revealed the through and cross-level tensions that emerge as a response to the attempts of leadership to communicate the strategic intentions as well as the techniques that have been used to resolve them.

The reason that the particular field of industry has been selected stems from the fact that aerospace and defense organizations have been little studied (Junni et al., 2013), despite the fact that they represent a sector where huge investment takes place in all parts of the world both by government and private businesses, and that is relevant to public security and safety and key to global, social, and economic development.

However, the difficulty to access a reliable and adequate sample of information due to confidentiality issues makes the study of this sector challenging and time consuming. This has also been a challenge for this study, which however managed to contribute to the understanding of ambidexterity in this particular sector of industry, by compiling a substantial amount of qualitative data that allowed the in-depth analysis of ambidexterity in this type of organizations and the cross-case analysis between different types and sizes of organizations. Of particular interest has been the cross-case analysis between government (public) and large corporations (private) that revealed striking similarities in terms of leadership styles, ambidexterity penetration, and organizational types, despite the differences in the management methods and objectives. Table 9.4 summarizes the contributions of this study to the understanding of ambidexterity in this types or organizations in the defense and aerospace sector.

Table 9.4: Overall contribution of this study to theory, research and practice in the field of ambidexterity and leadership

Levels of analysis	Chapters	Extension of previous research	Contribution to theory, research and practice
Micro-level: ambidextrous leadership	4 & 9.2.3	• Research of Davis et al. (2009) about optimal structure and market dynamism • Research of Jansen et al. (2009) about strategic leadership in exploration and exploitation and the role of environmental dynamism • Research of Aguinis et al. (2011) about the links between micro and macro domains	• Contribution to ambidextrous leadership theory and expanding of previous understandings on how organizational structure and environmental dynamism influence individual actions • Linking of the micro-level leadership behaviors with their macro-level activities that take place in the aerospace and defence industry • Cross-case analysis uncovered different challenges for ambidextrous leaders according to the type and size of the organization
Meso-level: a multilevel approach to ambidexterity	3 & 9.3.3	• Research of Andriopoulos & Lewis (2009) about the management of paradoxes of innovation at multiple organizational levels • Research of Birkinshaw & Gupta (2013) about the contribution of ambidexterity to the filed of	• Extension of previous research of Andriopoulos & Lewis (2009) and proposition of additional levels of ambidexterity penetration (horizontal, vertical, and organizational) • Extension of Birkinshaw & Gupta's (2013) and Boumgarden, Nickerson, & Zenger's (2012) previous research regarding the classification of ambidextrous organizations in the aerospace and defence industry

		organization studies • Research of Boumgarden, Nickerson, & Zenger (2012) about the relationship between ambidexterity and organizational performance • Research of Chandrasekaran et al. (2012) about the antecendents to ambidexterity competence at the project level in high technology organizations • Research of Heyden et al. (2015) about the conjoint influence of top and middle management characteristics on management innovation • Research of Turner & Lee-Kelley (2013) about the architecture, mechanisms and dynamics of ambidexterity at the project management level	• Extension of previous understandings about how ambidexterity can be managed within ambidextrous organizations at multiple levels (top management, middle management and employee levels), and measurement of the perceptual performance of the observed tensions in the aerospace and defence organizations • Contribution to literature by highlighting the key role of middle management in the ambidexterity penetration.

Macro-level: industry	2.4, 3.4 & 9.4.3	• Research of Miles & Snow (1978) about organizational strategy, structure and process • Research of Birkinshaw & Gupta (2013) and Simon (1962) about the contribution of ambidexterity to the filed of organization studies • Research of Hill & Birkinshaw (2014) about ambidexterity and survival in corporal venture units	• Extension of previous research of Miles & Snow's (1978) adaptive cycle about organizational types, and incorporation of recent research on ambidexterity into the framework • Contribution to ambidexterity theory and approaches, and expanding of previous understandings of how different ambidexterity approaches appear in the companies under investigation
Area of study			• Contribution to research in the field of ambidexterity and leadership in the aerospace and defense industry (not addressed in the existing literature)

As noted above, the main research method followed throughout this study has been the multilevel analysis of ambidexterity, which has been the backbone that links all the research objectives and contributes to the universal understanding of ambidexterity at this particular sector of industry. In this context, the ambidextrous leadership style in the micro-level is associated to an organizational ambidexterity type at the macro-level via the diffusion of ambidexterity throughout the organizational structure. This approach has revealed the existence of two discrete realizations of ambidexterity in the aerospace and defense sector: one representing the government organization and two large corporations that share common ambidexterity characteristics and the other representing the medium-sized company that shows a higher dynamism and different qualitative characteristics of ambidexterity at all the levels. These key findings are summarized in figures 9.4 and 9.5 below that represent the main contribution of this study in the understanding of ambidexterity and leadership in the aerospace and defense sector.

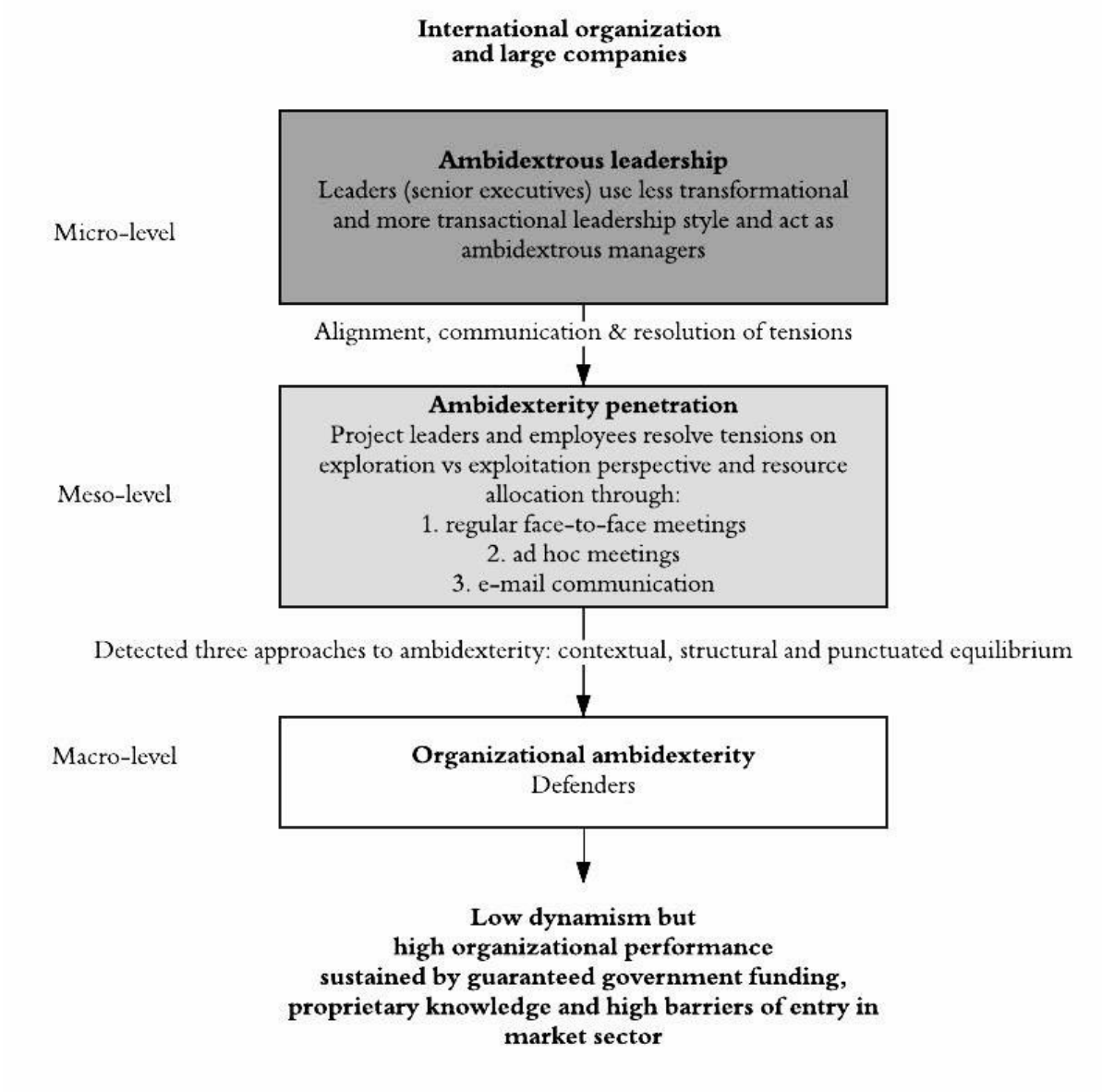

Figure 9.4: Findings overview and contribution to the field of ambidexterity and leadership at the international organization and large companies

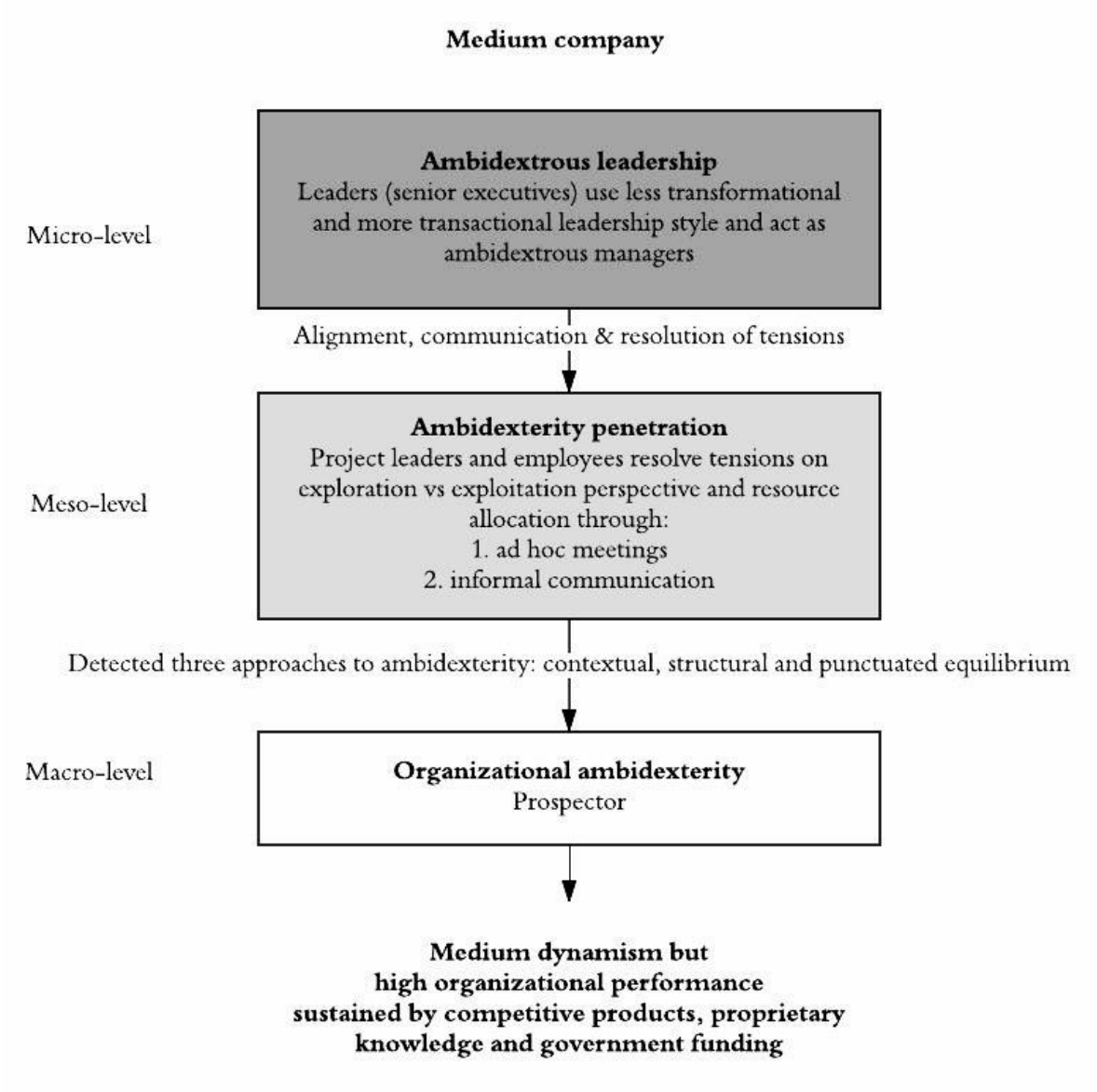

Figure 9.5: Findings and contribution to the field of ambidexterity and leadership at the medium-sized company

9.6 Conclusion

As a final conclusion, it was confirmed that various degrees of ambidexterity are present at the organizations that were studied. The findings also proved that the effort of applying ambidexterity in an organization is a challenging accomplishment, as tensions tend to arise due to different perspectives among different levels, with regards to the optimal actions due to differences in background knowledge or even culture. Leaders are supposed to make strategic choices and trade-offs among competing objectives, and the more effectively they balance these opposite elements, the more successful their companies will become. In this context, in the ambidextrous organizations of this study, top management teams facilitate the contradictory yet complementary issues of exploration and exploitation at the firm level. At the same time, they cooperate with middle management groups and communicate the ambidextrous strategy throughout their organization from the higher level down to the lower level of employees, utilizing several communication methods as the tools that resolve emerging tensions. However, the analysis of the collected data revealed that they emphasize more on exploitative activities, as their organizations operate in low to medium dynamism environments and present highly hierarchical organizational structures. Therefore, for these reasons, a low level of an overall ambidexterity penetration is observed in all the organizations under investigation. Consequently, we can conclude that in this particular field of industry, there is still a lot of potential for future improvement in terms of effective management, as despite the risks and possible tensions, the pursuit of ambidextrous strategy is worth the effort, as it has been proven that firms with ambidextrous leadership have more chances to achieve higher performance across multiple dimensions and successfully overcome the modern challenges.

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APPENDICES

APPENDIX 1(A): INTERVIEW QUESTIONS

INTERNATIONAL ORGANIZATION

You are kindly invited to respond with honesty to the following set of questions as part of my PhD research that investigates the applicability of **Ambidexterity** in Leadership Methods and Strategic Management both at Government (public) and Business (private) Organizations that operate in the highly challenging fields of High-Tech Electronics, Defense and Aerospace.

Ambidexterity, as is denoted by its name, relates to the ability of engaging simultaneously and efficiently into two different often contradicting but equally demanding tasks: Current Operations that are the Primary Purpose and Obligation of your Organization towards its superior authority, while at the same time allocating resources (in terms of personnel, time and money) for planning for the future development of your Organization that will allow it to adapt to the changing environment.

Note, that both your personal data as well as the data of your Organization will be kept confidential, will not be published or referenced in any way, as are not important for the processing of the provided information. Your participation will be classified as: Employee A,B,C etc. – Middle or Higher Level, and your Organization as: Gov. Organization A,B, C etc.

Please, keep your answers concise but do not hesitate to expand if you consider necessary. For several questions where choices or examples are provided to help and provide context, please do not hesitate to answer with options that are not provided. Thank You.

Part A: Interviewee introduction

1. What is the Level of Management in your Organization that best applies to your position/job description:
    i. High Management: Leader/Commander, Director of Unit or whole Program
    ii. Senior level management (executives)
    iii. Middle level management (project leader)
    iv. Employee
2. Years in the organization and in the specific position
3. Your Key management responsibilities (in short, not required to be specific)
4. The key challenges that have to be managed at the same time/simultaneously (in short)

Part B: Ambidextrous leadership

5. What leadership characteristics do you believe are the **most important** in order to manage a program or individual activity in your organization?
6. Which of the following traits does your superior exhibits when dealing with employees (if any): *Inspiration, motivation, communication of high expectations, using symbols to express important purposes in a simple way, individualized consideration of employees.*

7. Which of the following traits does your superior exhibits when trying to achieve the assigned goals (if any): *Clarification of goals, reward of goal achievement (in any way), intervention when necessary, management by exception.*
8. How much of time do you estimate that your superior invests in the standardized/current everyday activities (%)?
9. How much of time do you estimate that your superior invests in future planning (%)?

Part C: Ambidextrous tensions on different levels

10. Describe, in short, the most difficult/challenging problems to be resolved in the everyday communication
    - Between employees
    - Between employees and senior management. Are there any specific tensions that immerge between other employees and management? If yes, how do you cope with them?
11. What is the decision-making process like and how are the final decisions achieved? Who drives them?
12. How are the goals set and who is responsible to set them? (i.e. describe how IPTs work). Are you using any scorecard approach to link the project goals with the overall unit goals?
13. How often do you have formal and informal meetings at your level of management? Would you prefer communicating with management formally or informally?
14. Do you think that the senior management of your organization allocates most of the resources in current or future projects?

15. What are in general the main **short-term** and **long-term** goals of your middle management (projects leaders or directors) in relation to the recipients of your services ("customers")? Are they trying to achieve exactly what they require or are they allowed to have some form of *freedom or improvisation*?
16. Do your employees generally discuss their ideas with other team members? How do they make a final decision? Does the leadership of the individual units promote creativity and individual employee responsibilities or should the employees stick to specific goals and deadlines?

Part D: Organizational ambidexterity

17. Describe briefly what is the **short-term** and **long-term** strategy of your organization, e.g. cost savings, investment to future projects etc.
18. Does your organization strive to achieve the best possible result with the minimum cost (i.e. is cost efficiency considered) or performance is more important at any cost? (e.g. how do you manage to balance cost, schedule and performance/technical compliance?)
19. Describe briefly how does your Organization's planning & control system work? (e.g. planning dictated by parent organization, control by supervising authority?).
20. In which disciplines do you consider that your organization is **most** and **less** efficient?

    (e.g. Innovative ideas, cost efficiency, speedy accomplishment of goals etc.).
21. Which types of the following structures do you have in your organization? (There may exist more than one):
    - Separate units/teams: one for future projects, one for current projects (how many for future and how many for current projects)?

- Combined units/teams/individuals that work for both future projects and current projects
- If combined, most of the time is devoted to current projects and some of the time to new projects or vice versa?
- The organization mainly works on current projects, whereas future projects are allocated to other organizations or vice versa?

22. How would you characterize the dynamism of your Company's environment?

- Highly dynamic (fierce competition, low barriers of entry)
- Medium dynamism (many competitors, high barriers of entry or few competitors, low barriers of entry)
- Low dynamism (few competitors, high barriers of entry)

APPENDIX 1(B): INTERVIEW QUESTIONS

AEROSPACE & DEFENSE COMPANIES

You are kindly invited to respond with honesty to the following set of questions as part of my PhD research that investigates the applicability of **Ambidexterity** in Leadership Methods and Strategic Management both at Government (public) and Business (private) Organizations that operate in the highly challenging fields of High-Tech Electronics, Defense and Aerospace.

Ambidexterity, as is denoted by its name, relates to the ability of engaging simultaneously and efficiently into two different often contradicting but equally demanding tasks: Current Operations that are the Primary Purpose and Obligation of your company towards its superior authority, while at the same time allocating resources (in terms of personnel, time and money) for planning for the future development of your company that will allow it to adapt to the changing environment.

Note, that both your personal data as well as the data of your company will be kept confidential, will not be published or referenced in any way, as are not important for the processing of the provided information. Your participation will be classified as: Employee A,B,C etc. – Middle or Higher Level, and your company as: High-tech Company A,B,C etc.

Please, keep your answers concise but do not hesitate to expand if you consider necessary. For several questions where choices or examples are provided to help and provide context, please do not hesitate to answer with options that are not provided. Thank You.

Part A: Interviewee Introduction

1. What is the Level of Management in your Company that best applies to your position/job description:
    i. High Management: Leader, Director of Unit or whole Program
    ii. Senior level management (executives)
    iii. Middle level management (project leader)
    iv. Employee
2. Years in the company and in the specific position
3. Your Key management responsibilities (in short, not required to be specific)
4. The key challenges that have to be managed at the same time/simultaneously (in short)

Part B: Ambidextrous leadership

5. What leadership characteristics do you believe are the **most important** in order to manage a program/project or individual activity in your company?
6. Which of the following traits does your superior exhibits when dealing with employees (if any): *Inspiration, motivation, communication of high expectations, using symbols to express important purposes in a simple way, individualized consideration of employees.*

7. Which of the following traits does your superior exhibits when trying to achieve the assigned goals (if any): *Clarification of goals, reward of goal achievement (in any way), intervention when necessary, management by exception.*
8. How much of time do you estimate that your superior invests in the standardized/current everyday activities (%)?
9. How much of time do you estimate that your superior invests in future planning (%)?

Part C: Ambidextrous tensions on different levels

10. Describe, in short, the most difficult/challenging problems to be resolved in the everyday communication
    - Between employees
    - Between employees and senior management. Are there any specific tensions that immerge between other employees and management? If yes, how do you cope with them?
11. What is the decision-making process like and how are the final decisions achieved in the project? Who drives them?
12. How are the goals set and who is responsible to set them? Are you using any scorecard approach to link the project goals with the overall unit goals?
13. How often do you have formal and informal meetings at your level of management? Would you prefer communicating with management formally or informally?
14. Do you think that the senior management of your company/business unit allocates most of the resources in current or future projects?
15. What are in general the main **short-term** and **long-term** goals of your middle management (projects leaders or directors) in relation to the recipients of your

services (“customers”)? Are they trying to achieve exactly what they require or are they allowed to have some form of *freedom or improvisation*?

16. Do your employees generally discuss their ideas with other team members? How do they make a final decision?
17. Does the leadership of the individual units promote creativity and individual employee responsibilities or should the employees stick to specific goals and deadlines?

Part D: Organizational ambidexterity

18. Describe briefly what is the **short-term** and **long-term** strategy of your company, e.g. cost savings, investment to future projects etc.
19. Does your company strive to achieve the best possible result with the minimum cost (i.e. is cost efficiency considered) or performance is more important at any cost?
20. How does the promotion scheme works at your company and who is responsible for that? (e.g. HR or senior management etc.)
21. Describe briefly how does your Company’s planning, control & reward system work? (e.g. planning dictated by parent company, control by supervising authority, monetary or honorary rewards for performance?).
22. In which disciplines do you consider that your company is **most** and **less** efficient?

    (e.g. Innovative ideas, cost efficiency, speedy accomplishment of goals etc.).
23. Which types of the following structures do you have in your company? (There may exist more than one):

- Separate units/teams: one for future projects, one for current projects (how many for future and how many for current projects)?
- Combined units/teams/individuals that work for both future projects and current projects
- If combined, most of the time is devoted to current projects and some of the time to new projects or vice versa?
- The company mainly works on current projects, whereas future projects are allocated to other companies or vice versa?

24. How would you characterize the dynamism of your Company's environment?

- Highly dynamic (fierce competition, low barriers of entry)
- Medium dynamism (many competitors, high barriers of entry or few competitors, low barriers of entry)
- Low dynamism (few competitors, high barriers of entry)

APPENDIX 1(C): FOLLOW-UP QUESTIONS

INTERNATIONAL ORGANIZATION: BUSINESS UNIT D

Part A: Interviewee Introduction

1. What is the Level of Management in your Company that best applies to your position/job description:
    i. High Management: Leader, Director of Unit or whole Program
    ii. Senior level management (executives)
    iii. Middle level management (project leader)
    iv. Employee
2. Years in the company and in the specific position
3. Your Key management responsibilities (in short, not required to be specific)
4. The key challenges that have to be managed at the same time/simultaneously (in short)

Part B: Initiatives of ambidexterity and leadership

5. Please describe how a project is managed at your business unit.
6. How does the leader in your business unit manage cost efficiency and innovative ideas?
7. Recently, risk management has become an integral part of a project management. Could you please describe how explorative projects and risk management analysis are linked and managed in your business unit?

APPENDIX 2(A): EXAMPLE OF AN E-MAIL INTERVIEW

INTERNATIONAL ORGANIZATION

Part A: Interviewee Introduction

1. What is the Level of Management in your Organization that best applies to your position/job description:
    i. High Management: Leader/Commander, Director of Unit or whole Program
    ii. Senior level management (executives)
    iii. Middle level management (project leader)
    iv. Employee (Integrated Product Team leader)
2. Years in the organization and in the specific position 9 years, lead (systems) engineer
3. Your Key management responsibilities (in short, not required to be specific) Leading and co-chairing a small group of engineers on a daily basis. The team consists of 3 direct, ~8 indirect subject matter experts.
4. The key challenges that have to be managed at the same time/simultaneously (in short) Multinational team with different backgrounds/experiences and cultural differences. Mentioned "co-chairing" in para 3 above – two project teams work cooperatively on two products but with mostly common requirements; the two teams have different organizational needs and business processes that need to be synchronized while the two teams are geographically not co-located.

Part B: Ambidextrous leadership

5. What leadership characteristics do you believe are the **most important** in order to manage a program or individual activity in your organization? Open minded, good communication skills, forward looking, motivate/inspire team members
6. Which of the following traits does your superior exhibits when dealing with employees: *Inspiration, motivation, communication of high expectations, using symbols to express important purposes in a simple way, individualized consideration of employees.*
7. Which of the following traits does your superior exhibits when trying to achieve the assigned goals: *Clarification of goals, reward of goal achievement (in any way), intervention when necessary, management by exception.*
8. How much of time do you estimate that your superior invests in the standardized/current everyday activities (%)? 60%
9. How much of time do you estimate that your superior invests in future planning (%)? 40% (Note for clarification to evaluate the figures: our job is executing/implementing the project, delivering the product on time, on budget, on requirements. Therefore, in this context, planning is associated with the activities that part of the look ahead / schedule).

Part C: Ambidextrous tensions on different levels

10. Describe, in short, the most difficult/challenging problems to be resolved in the everyday communication
    - Between employees: Getting different views, comments that need to be consolidated

- Between employees and senior management: Management does not want to know about the details, but expecting recommendations with sufficient facts to make decisions. This always turns into micromanagement.

11. What is the decision-making process like and how are the final decisions achieved? Who drives them? Top-bottom, but recommendation is well taken by management. Ultimate decision is in one hand. Even there is no agreement in decision at the working level, team always respect any decision and move forward with that guidance.

12. Are there any specific tensions that immerge between other employees and management? If yes, how do you cope with them? Tensions have always been part of our work during communication. I say, it is important to socialize with colleagues and stakeholders to ease tension.

13. What is the communication like within the team, with CEO/leader and with other Directors/projects leaders? Daily/weekly in person, telephonically and via email.

14. How often do you have formal and informal meetings at your level of management? Would you prefer communicating with management formally or informally? Formal, recurrent meetings are on weekly/bi-weekly basis. Informal, ad-hoc discussions can happen every day. I personally prefer 'warming up' the subject prior to critical decisions which means let's do the leg work informally first before going into formal.

15. Do you think that the senior management of your organization allocates most of the resources in current or future projects? Well, our organization cannot always be adjusted in order to be able to respond to future project needs. However the organization has been set in a certain way to always allow the allocation of

subject matter experts for the support of either ongoing projects or future project planning. We call this "matrix" organization, when an expert can be temporarily assigned to other activities while not leaving his branch/division.

16. What are in general the main short-term and long-term goals of your middle management (projects leaders or directors) in relation to the recipients of your services? Are they trying to achieve exactly what they require or are they allowed to have some form of *freedom or improvisation*? At strategic level (agency), we set annual goals and objectives and we assess achievements at end of calendar year. At the project level, we start from the annual goals and objectives and then break them down to quarters (i.e., 90 day look ahead). We are allowed to adjust objectives and scope based program schedule changes; however, we do not deviate from the final goal. So, certain freedom is allowed, but that is always coordinated at the project level.

17. Do you think that the bureaucratic structure of your organization affects the creativity of your employees? How do they cope with that? No, I do not think that, but of course, each individual should learn the respect first and that's the key how to influence or balance the bureaucracy.

18. Do your employees generally discuss their ideas with other team members and how do they interact with each other? How do they make a final decision? Yes, it is a must. Each expert has a unique area which he/she is responsible for. Within the engineering team everybody has the same level of voting opportunity for finalizing the recommendations for decisions. If there is no consensus at the lowest level, then the issue has to be elevated to the next level.

19. Does the leadership of the individual units promote creativity and individual employee responsibilities? If yes, how? Yes. Responsibilities are formally

recorded in the Job Descriptions while creativity is recognized during task execution. Once creativity is recognized from any individual then that person becomes the owner of that and it is utilized later for other areas.

Part D: Organizational ambidexterity

20. Describe briefly what is the short-term and long-term strategy of your organization, e.g. cost savings, investment to future projects etc. Short-term strategy is to deliver/complete ongoing projects on time, on budget and on performance. Long-term strategy is to set and establish the future projects to keep the organization in life …

21. Does your organization strive to achieve the best possible result with the minimum cost (i.e. is cost efficiency considered)? We have 3 pillars for each project, which are cost, schedule, and performance/technical compliance. We have a very comprehensive & rigorous process to balance among these 3 pillars.

22. Describe briefly how does your Organization's planning, control and reward system work? (e.g. planning dictated by parent organization, control by supervising authority, monetary or honorary rewards for performance?) We are an acquisition (program execution) like organization with future planning capabilities as well. Planning is based on our "costumer's" needs for modernizing and sustaining their assets and available budget that is provided by the "owner" of the assets. Control is exercised by Board of Directors who represents the "owner". We are considered as a 'Government' like organization, so there is no honorary rewards (bonus) applicable.

23. In which disciplines do you consider that your organization is **most** and **less** efficient?

(e.g. Innovative ideas, cost efficiency, speedy accomplishment of goals etc.). Most efficient: cost/performance efficiency; Less efficient: we do have innovative ideas, but budget is limited

24. Which types of the following structures do you have in your organization? (There may exist more than one):

- Separate units/teams: one for future projects, one for current projects (how many for future and how many for current projects)? --- *1 for future and multiple for current*
- Combined units/teams/individuals that work for both future projects and current projects --- *future and current project teams are supported by experts coming from other branches/sections (matrix organization)*
- If combined, most of the time is devoted to current projects and some of the time to new projects or vice versa? --- *Depends on prioritization*
- The organization mainly works on current projects, whereas future projects are allocated to other organizations or vice versa?

25. How would you characterize the dynamism of your Organizations environment, if applicable for your case?

- Highly dynamic (fierce competition, low barriers of entry)
- Medium dynamism (many competitors, high barriers of entry or few competitors, low barriers of entry)
- Low dynamism (few competitors, high barriers of entry)

Thank you for your time

APPENDIX 2(B): EXAMPLE OF AN E-MAIL INTERVIEW

AEROSPACE & DEFENSE COMPANIES

Part A: Interviewee Introduction

1. What is the Level of Management in your Company that best applies to your position/job description:

i. High Management: Leader, Director of Unit or whole Program

ii. Senior level management (executives)

iii. Middle level management (project leader)

iv. Employee

2. Years in the company and in the specific position: 5

3. Your Key management responsibilities (in short, not required to be specific): non-technical project management and contract management of radar upgrade projects; team leadership of team of 4 engineers involved in customer support and project support; steering the team leaders overall w.r.t. internal organization and people management

4. The key challenges that have to be managed at the same time/simultaneously (in short): customer contact (business development related and running projects related), motivating team leaders and team members while translating concerns from within the organization to higher management, stay up to date with and understand technical matters

Part B: Ambidextrous leadership

5. What leadership characteristics do you believe are the **most important** in order to manage a program or individual activity in your company?: (1) the ability to

really listen in order to understand people's thoughts and actions, and (2) coach people in order to make them think and reflect upon their actions and motives

6. Which of the following traits does your superior exhibits when dealing with employees (if any): *Inspiration, motivation, communication of high expectations, using symbols to express important purposes in a simple way, individualized consideration of employees.*
7. Which of the following traits does your superior exhibits when trying to achieve the assigned goals (if any): *Clarification of goals, reward of goal achievement (in any way), intervention when necessary, management by exception.*
8. How much of time do you estimate that your superior invests in the standardized/current everyday activities (%)? 80% (too much, to the frustration of many employees)
9. How much of time do you estimate that your superior invests in future planning (%)? 20% (mostly thinking tactical on the short / mid term; planning on the long term is done as well but in a very pragmatic way and there is low commitment from the employees because these LT plans are not communicated in a consistent way)

Part C: Ambidextrous tensions on different levels

10. Describe, in short, the most difficult/challenging problems to be resolved in the everyday communication

- Between employees: prioritization of tasks is unclear; historically, groups grew around products and people are used to focus internally on their own product(s). As such, it is very hard to revert this focus external, what is required to address the bigger projects we're running nowadays.

- Between employees and senior management. Are there any specific tensions that immerge between other employees and management? If yes, how do you cope with them? To state it very simple: many employees show poor motivation due to lack of "ownership" over their work. Senior management is frustrated because employees show little initiative. Personally, I coped with it by doing my master consultancy report to graduate from an mba on the subject of people management: how it depends on understanding of a clear vision and strategies and the impact on success of the organization in an ambidextrous context. The key issues I concluded and reported to senior management are (1) involve the pioneers within the organization into a facilitated strategy workshop(s) in order to "transfer ownership of the vision" to them, (2) set up and coach a management team (by external expert (psychologist)) in order to prepare them to pick up management tasks, (3) consistently inform employees on the vision, how we want to go there and simply on what goes on in the organization and (4) assess the interests / talents of employees and have them trained formally in order to develop them. This is all still very warm and senior management has taken in these recommendations but we're currently in the process of investigating how to materialize things.

11. What is the decision-making process like and how are the final decisions achieved? Who drives them? In the end, senior manager decides, although he tries to push decision making to others in the organization. It doesn't work out well due to…to state it very simple… many employees show poor motivation due to lack of "ownership" over their work. Senior management is frustrated because employees show little initiative…

12. How are the goals set and who is responsible to set them? Are you using any scorecard approach to link the project goals with the overall unit goals? Goals are very unclear due to pragmatic approach (no scorecards or things like that). Priorities change quickly. Senior manager stipulates main goals, some employees work on small projects in which they set their own short-term goals.
13. How often do you have formal and informal meetings at your level of management? Would you prefer communicating with management formally or informally? I have daily informal meeting at team level and with senior management. Within our team of 4 engineers, two of them work very autonomous, they other I steer a bit more. Informal meeting works fine for this. We try to evaluate progress formally once a month but I'm not consequent enough in this. Informal meeting with senior management defines 70-80% of my daily agenda. I would like to reduce this. To my opinion (and that's something I communicated in my mcp as well as part of improving internal information), there should be a formal reporting from mid to senior management, say on a weekly basis. Nowadays there is no formal reporting, resulting in frustration at senior management level and wrong prioritization of tasks. Downward instructions could be done in a much more consistent way.
14. Do you think that the senior management of your company allocates most of the resources in current or future projects? The current projects carry the resources magnet, stalling future projects.
15. What are in general the main **short-term** and **long-term** goals of your middle management (projects leaders or directors) in relation to the recipients of your services ("customers")? Are they trying to achieve exactly what they require or are they allowed to have some form of *freedom or improvisation*? In general,

senior and mid management has way too much improvisation. This is fine for the research alike, innovative work but this attitude poses a big hurdle in running projects.

16. Do your employees generally discuss their ideas with other team members? How do they make a final decision? Ideas usually come from the senior manager. He discusses these with some key engineers to check water proofness. He makes the final decision.

17. Does the leadership of the individual units promote creativity and individual employee responsibilities or should the employees stick to specific goals and deadlines? The former, however, this is not what most employees want. They don't want to be nailed down but they want at least some outlines.

Part D: Organizational ambidexterity

18. Describe briefly what is the **short-term** and **long-term** strategy of your company, e.g. cost savings, investment to future projects etc. ST: place NGSP technology in the market; LT: partner-up with investor in order to enable growth

19. Does your company strive to achieve the best possible result with the minimum cost (i.e. is cost efficiency considered) or performance is more important at any cost? Performance is more important. We beat competition on our product leadership.

20. How does the promotion scheme works at your company and who is responsible for that? (e.g. HR or senior management etc.). Senior management evaluates everyone once a year in order to try to bring relative logic in wages. As we have a very flat hierarchy, there is no real promotion. Last year, a pool of team leaders was selected to receive bonuses but this was done ad hoc without even speaking

with the subject employees. There was also no function description, no clear responsibility, no screening. So, I think, it doesn't work.

21. Describe briefly how does your Company's planning, control & reward system work? (e.g. planning dictated by parent company, control by supervising authority, monetary or honorary rewards for performance?). There is no transparent planning, nor control, nor reward system.

22. In which disciplines do you consider that your company is **most** and **less** efficient?(e.g. Innovative ideas, cost efficiency, speedy accomplishment of goals etc.). Most: offer agile solutions to customers who are very flexible, expert engineering; Less: internal communication / motivation, project management, general management, marketing, business development.

23. Which types of the following structures do you have in your company? (There may exist more than one):

a. Separate units/teams: one for future projects, one for current projects (how many for future and how many for current projects)? No

b. Combined units/teams/individuals that work for both future projects and current projects? Yes

c. If combined, most of the time is devoted to current projects and some of the time to new projects or vice versa? Most current

d. The company mainly works on current projects, whereas future projects are allocated to other companies or vice versa? We don't have an open innovation, however, signs are that things might flow out of our innovation funnel to future partners. No inward moves.

24. How would you characterize the dynamism of your Company's environment?

a. Highly dynamic (fierce competition, low barriers of entry)

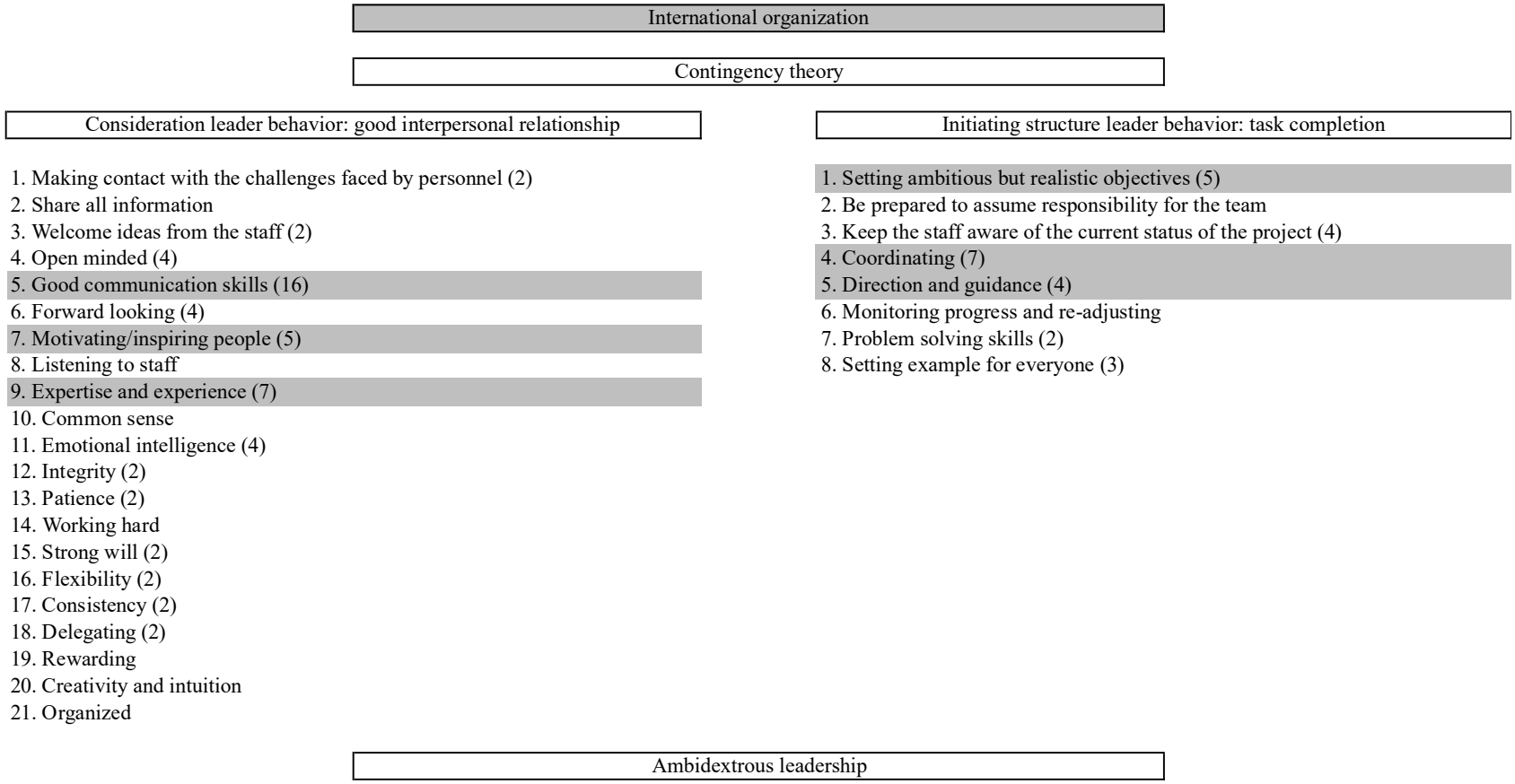
b. Medium dynamism (many competitors, high barriers of entry or few competitors, low barriers of entry)

c. Low dynamism (few competitors, high barriers of entry)

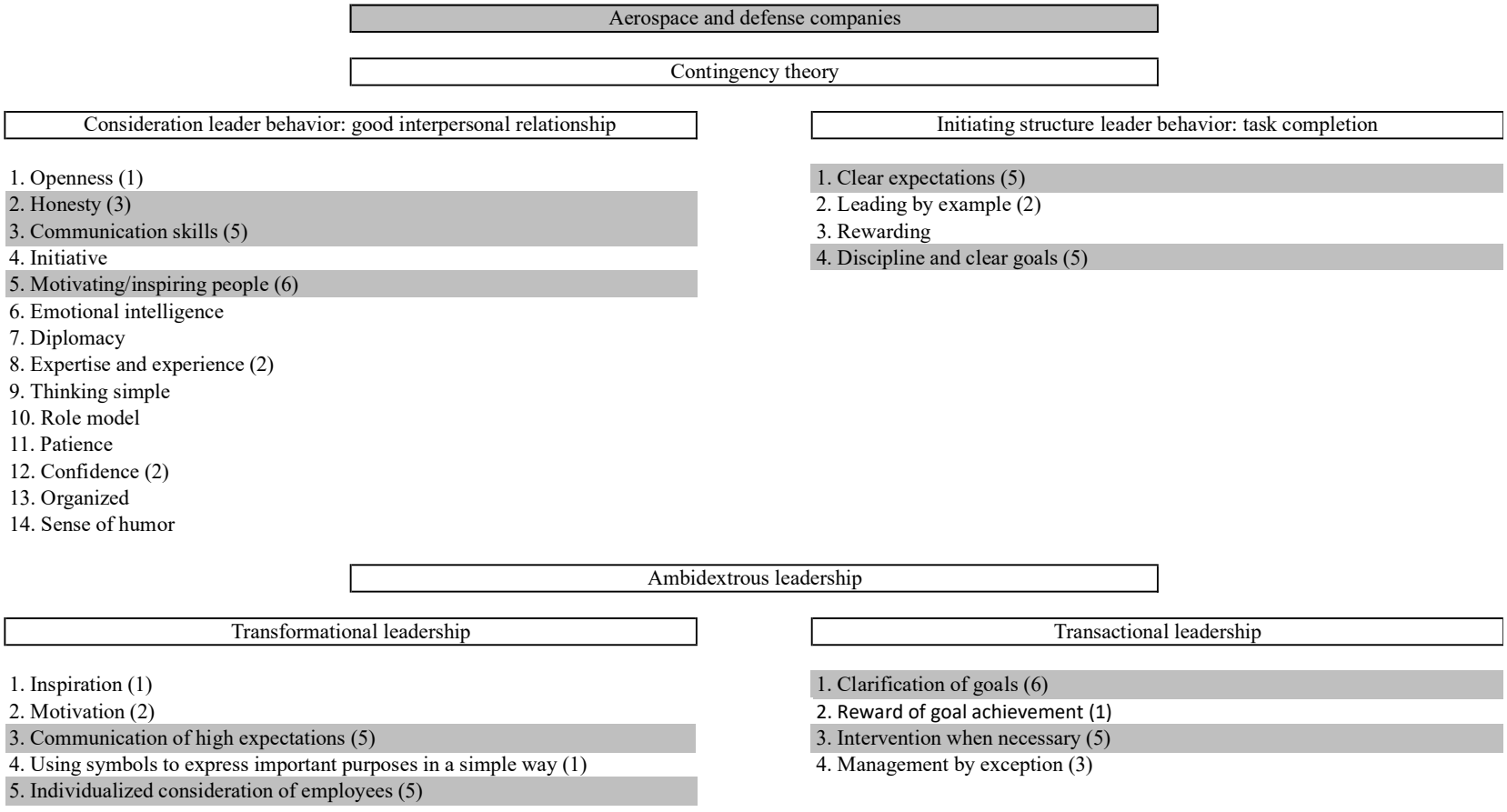
Thank you for your time

You're very welcome. Would be nice if you could share some general results of your study. Happy to discuss things further.

Appendix 3: Visual representation of contingency theory and ambidextrous leadership in the international organization



Appendix 4: Visual representation of contingency theory and ambidextrous leadership in the aerospace and defense companies



Appendix 5: % of time that leaders invest on standardized/everyday activities